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CASA DIABLO IV GEOTHERMAL DEVELOPMENT PROJECT

FINAL
JOINT ENVIRONMENTAL IMPACT STATEMENT AND ENVIRONMENTAL IMPACT REPORT



Volume 2
Appendices

June 2013

DOI Control #: DES 12-21
Publication Index #: BLM/CA/ES-2013/021+3200+1793
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DOI Control No. DES 12-21

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Final
Joint Environmental Impact Statement and Environmental Impact Report
for the
Casa Diablo IV Geothermal Development Project

Volume 2 – Appendices

For the

BLM, Bishop Field Office
US Forest Service, Inyo National Forest
and
Great Basin Unified Air Pollution Control District
Bishop, California

June 2013

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State Clearinghouse No. 2011041008

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STATE OF CALIFORNIA — Edmund G. Brown, Jr., Governor

NATIVE AMERICAN HERITAGE COMMISSION
915 CAPITOL MALL, ROOM 364
SACRAMENTO, CA 95814
(916) 653-6251
Fax (916) 657-5390
Web Site www.nahc.ca.gov
ds_nahc@pacbell.net

RECEIVED
NOV 21 2012
GREAT BASIN UNIFIED APCD

November 19, 2012

Ms. Jan Sudomier, Project Manager
Great Basin United Air Pollution District
157 Short Street
Bishop, CA 93514

Re: SCH#2011041008; Joint NEPA.CEQA Document; draft Environmental Impact Report and draft Environmental Impact Statement (DEIR/DEIS) for the **"CASA DIABLO IV GEOTHERMAL DEVELOPMENT PROJECT;"** located in the Town of Mammoth Lakes; Mono County, California

Dear Ms. Sudomeir:

The NAHC is the State of California 'Trustee Agency' for the protection and preservation of Native American cultural resources pursuant to California Public Resources Code §21070 and affirmed by the Third Appellate Court in the case of EPIC v. Johnson (1985: 170 Cal App. 3rd 604).

This letter includes state and federal statutes relating to Native American historic properties or resources of religious and cultural significance to American Indian tribes and interested Native American individuals as 'consulting parties' under both state and federal law. State law also addresses the freedom of Native American Religious Expression in Public Resources Code §5097.9.

The California Environmental Quality Act (CEQA – CA Public Resources Code 21000-21177, amendment s effective 3/18/2010) requires that any project that causes a substantial adverse change in the significance of an historical resource, that includes archaeological resources, is a 'significant effect' requiring the preparation of an Environmental Impact Report (EIR) per the CEQA Guidelines defines a significant impact on the environment as 'a substantial, or potentially substantial, adverse change in any of physical conditions within an area affected by the proposed project, including ...objects of historic or aesthetic significance." In order to comply with this provision, the lead agency is required to assess whether the project will have an adverse impact on these resources within the 'area of potential effect (APE), and if so, to mitigate that effect. The NAHC advises the Lead Agency to request a Sacred Lands File search of the NAHC if one has not been done for the 'area of potential effect' or APE previously.

The NAHC "Sacred Sites,' as defined by the Native American Heritage Commission and the California Legislature in California Public Resources Code §§5097.94(a) and 5097.96. Items in the NAHC Sacred Lands Inventory are confidential and exempt from the Public Records Act pursuant to California Government Code §6254 (r).

Early consultation with Native American tribes in your area is the best way to avoid unanticipated discoveries of cultural resources or burial sites once a project is underway. Culturally affiliated tribes and individuals may have knowledge of the religious and cultural significance of the historic properties in the project area (e.g. APE). We strongly urge that you make contact with the list of Native American Contacts on the attached list of Native American contacts, to see if your proposed project might impact Native American cultural resources and to obtain their recommendations concerning the proposed project. Pursuant to CA Public Resources Code § 5097.95, the NAHC requests cooperation from other public agencies in order that the Native American consulting parties be provided pertinent project information. Consultation with Native American communities is also a matter of environmental justice as defined by California Government Code §65040.12(e). Pursuant to CA Public Resources Code §5097.95, the NAHC requests that pertinent project information be provided consulting tribal parties, including archaeological studies. The NAHC recommends *avoidance* as defined by CEQA Guidelines §15370(a) to pursuing a project that would damage or destroy Native American cultural resources and California Public Resources Code Section 21083.2 (Archaeological Resources) that requires documentation, data recovery of cultural resources, construction to avoid sites and the possible use of covenant easements to protect sites. A1-1

Furthermore, the NAHC if the proposed project is under the jurisdiction of the statutes and regulations of the National Environmental Policy Act (e.g. NEPA; 42 U.S.C. 4321-43351). Consultation with tribes and interested Native American consulting parties, on the NAHC list, should be conducted in compliance with the requirements of federal NEPA and Section 106 and 4(f) of federal NHPA (16 U.S.C. 470 *et seq*), 36 CFR Part 800.3 (f) (2) & .5, the President's Council on Environmental Quality (CSQ, 42 U.S.C 4371 *et seq.* and NAGPRA (25 U.S.C. 3001-3013) as appropriate. The 1992 *Secretary of the Interiors Standards for the Treatment of Historic Properties* were revised so that they could be applied to all historic resource types included in the National Register of Historic Places and including cultural landscapes. Also, federal Executive Orders Nos. 11593 (preservation of cultural environment), 13175 (coordination & consultation) and 13007 (Sacred Sites) are helpful, supportive guides for Section 106 consultation. The aforementioned Secretary of the Interior's *Standards* include recommendations for all 'lead agencies' to consider the historic context of proposed projects and to "research" the cultural landscape that might include the 'area of potential effect.' A1-2

Confidentiality of "historic properties of religious and cultural significance" should also be considered as protected by California Government Code §6254(r) and may also be protected under Section 304 of he NHPA or at the Secretary of the Interior discretion if not eligible for listing on the National Register of Historic Places. The Secretary may also be advised by the federal Indian Religious Freedom Act (cf. 42 U.S.C., 1996) in issuing a decision on whether or not to disclose items of religious and/or cultural significance identified in or near the APEs and possibility threatened by proposed project activity. A1-3

Furthermore, Public Resources Code Section 5097.98, California Government Code §27491 and Health & Safety Code Section 7050.5 provide for provisions for inadvertent discovery of human remains mandate the processes to be followed in the event of a discovery of human remains in a project location other than a 'dedicated cemetery'. A1-4

To be effective, consultation on specific projects must be the result of an ongoing relationship between Native American tribes and lead agencies, project proponents and their contractors, in the opinion of the NAHC. Regarding tribal consultation, a relationship built around regular meetings and informal involvement with local tribes will lead to more qualitative consultation tribal input on specific projects. A1-5

Finally, when Native American cultural sites and/or Native American burial sites are prevalent within the project site, the NAHC recommends 'avoidance' of the site as referenced by CEQA Guidelines Section 15370(a). A1-6

If you have any questions about this response to your request, please do not hesitate to contact me at (916) 653-6251.

Sincerely,

Dave Singleton
Program Analyst

Cc: State Clearinghouse

Attachment: Native American Contact List

Native American Contacts
Mono County
November 19, 2012

Benton Paiute Reservation
Billie (Jake) Saulque, Chairperson
25669 Highway 6 PMB I — Paiute
Benton , CA 93512
numic@qnet.com
(760) 933-2321
(760)933-2412

Mono Lake Indian Community
Charlotte Lange, Chairperson
P.O. Box 117 — Mono
Big Pine , CA 93513 — Northern Pauite
clange2008@hotmail.com
(760) 938-1190

Big Pine Band of Owens Valley
Virgil Moose, Chairperson
P. O. Box 700 — Owens Valley Paiute
Big Pine , CA 93513
bigpinetribaladmin@earthlink
760- 938-2003
(760) 938-2942-FAX

Big Pine Band of Owens Valley THPO
Bill Helmer, Tribal Historic Preservation Officer
P.O. Box 700 — Paiute
Big Pine , CA 93513
amargosa@aol.com
(760) 938-2003
(760) 937-3331 - cell
(760) 938-2942 fax

Bishop Paiute Tribe
Chad Delgado, Chairperson
50 Tu Su Lane — Paiute - Shoshone
Bishop , CA 93514
(760) 873-3584
(760) 873-4143

Bishop Paiute Tribe THPO
Raymond Andrews, THPO
50 Tu Su Lane — Paiute - Shoshone
Bishop , CA 93514
(520) 404-7992 - cell
(760) 873-4143 - FAX

Bridgeport Paiute Indian Colony
John L. Glazier, Chairperson
P.O. Box 37 — Paiute
Bridgeport , CA 93517
chair@bridgeportindiancolon
(760) 932-7083
(760) 932-7846 Fax

KutzadikaA Indian Community Cultural Presv.
Raymond Andrews, Chairman
P.O. Box 591 — Paiute
Bishop , CA 93515
(760) 920-0357

This list is current only as of the date of this document.

Distribution of this list does not relieve any person of the statutory responsibility as defined in Section 7050.5 of the Health and Safety Code, Section 5097.94 of the Public Resources Code and Section 5097.98 of the Public Resources Code.

This list is applicable for contacting local Native Americans with regard to cultural resources for the proposed SCH#2011041008; Joint NEPA/CEQA Document; draft Environmental Impact Report and draft Environmental Impact Statement (DEIR/DEIS) for the Casa Diablo IV Geothermal Development Project; located in the Town of Mammoth Lakes; Mono County, California.

Native American Contacts
Mono County
November 19, 2012

Bridgeport Indian Colony
Cultural Resources Coordinator
P.O. Box 37 Paiute
Bridgeport , CA 93517
culture@bridgeportindiancol
(760) 932-7083
(760) 932-7846

This list is current only as of the date of this document.

Distribution of this list does not relieve any person of the statutory responsibility as defined in Section 7050.5 of the Health and Safety Code, Section 5097.94 of the Public Resources Code and Section 5097.98 of the Public Resources Code.

This list is applicable for contacting local Native Americans with regard to cultural resources for the proposed SCH#2011041008; Joint NEPA/CEQA Document; draft Environmental Impact Report and draft Environmental Impact Statement (DEIR/DEIS) for the Casa Diablo IV Geothermal Development Project; located in the Town of Mammoth Lakes; Mono County, California.

DEPARTMENT OF TRANSPORTATION
DISTRICT 9
500 SOUTH MAIN STREET
BISHOP, CA 93514
PHONE (760) 872-0785
FAX (760) 872-0754
TTY 711 (760) 872-0785
www.dot.ca.gov

Comment Letter A2

Flex your power!
Be energy efficient!

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NOV 21 2012
BY: Minerals

November 30, 2012

Collin Reinhardt, Project Manager
Bureau of Land Management
351 Pacu Lane, Suite 100
Bishop, California 93514

File: Mno-395-26
D EIS/EIR
SCH #: 2011041008

Dear Mr. Reinhardt:

Casa Diablo IV Geothermal Plant - Draft Environmental Impact Statement/Report

The California Department of Transportation (Caltrans) District 9 appreciates being able to review the draft environmental document for the geothermal plant east of US 395, and accessing US 395 at the State Route (SR) 203 undercrossing. We offer the following: A2-1

- It appears the previously proposed recycled water pipe line in the vicinity of SR 203 is no longer a project feature. Hence, the only new crossing would be at US 395 adjacent to the existing crossing. The design, permitting, and construction would be similar to what was done in the past.

Per the information provided, State highway traffic would not be significantly impacted. If any traffic control (e.g. signage) is proposed in State right-of-way, it could be included in the encroachment permit. For permitting details, Kurt Weiermann may be reached at (760) 872-0781 or kurt.weiermann@dot.ca.gov. See also: A2-2

Encroachment Permit Application:
http://www.dot.ca.gov/hq/traffops/developserv/permits/pdf/forms/Std._E.P._Application_(TR-0100).pdf

Encroachment Permit Instructions:
http://www.dot.ca.gov/hq/traffops/developserv/permits/pdf/forms/encrchpermt_instruc.pdf

- Any oversized/overweight loads would require a permit from the Transportation Permits Office. See: http://www.dot.ca.gov/hq/traffops/permits/

We value a cooperative working relationship regarding State highway issues. You may contact me at (760) 872-0785, with any questions.

Sincerely,

Gayle J. Rosander

GAYLE J. ROSANDER
IGR/CEQA Coordinator

c: State Clearinghouse
Jan Sudomeir, Great Basin Unified Air Pollution Control District
Mark Reistetter, Caltrans

Comment Letter A3

From: Long Valley Fire [mailto:longvalleyfd@gmail.com]

Sent: Monday, January 07, 2013 1:23 PM

To: BLM_CA_Bishop_Public_Comment

Subject: CD 4- Geothermal plant

January 7, 2013

United States Department of the Interior

BUREAU OF LAND MANAGEMENT

Bishop Field Office

351 Pacu Lane Suite 100 Bishop, California 93514

www.blm.gov/ca/bishop<http://www.blm.gov/ca/bishop>

Re: Public comments on the Casa Diablo IV-CD4 DEIS/R.

To Whom It May Concern:

I have reviewed the Casa Diablo IV-CD4 DEIS/R for the Geothermal Plant 4 project and have the following comments.

1. Several of the figures (aerial project layouts) show Town of Mammoth Lakes Municipal boundaries and private owned parcels. It is our recommendation that the Long Valley Fire Protection District boundary be shown on these figures as well. In particular Figure 3.10-1. Long Valley is capable and ready to continue to provide service inside its boundaries

A3-1

The Long Valley Fire Protection District has continued fire services and code compliance for the geothermal plant since the plant has opened in the early 1980's. Currently we are working on the newly proposed construction of CD4 and its fire code compliances and look forward to future remodel and expansion projects. Please contact me if you require a copy of our district map for your records and I am available for any additional information you may need. Thank you for your time.

A3-2

Sincerely,

Vince Maniaci -Chief

Long Valley Fire Dept

760-935-4545

fax 760-935-4436

longvalleyfd@gmail.com<mailto:longvalleyfd@gmail.com>

Town of Mammoth Lakes
P.O. Box 1609, Mammoth Lakes, CA 93546
(760) 934-8989 fax (760) 934-8608
www.ci.mammoth-lakes.ca.us

Collin Reinhardt
Bureau of Land Management
Bishop Field Office
351 Pacu Lane, Suite 100
Bishop, CA 93514

Attn: Casa Diablo IV Geothermal Development Project

January 7, 2013

Dear Mr. Reinhardt:

Thank you for the opportunity to review the Joint Draft Environmental Impact Statement/Environmental Impact Report (EIS/EIR) for the Casa Diablo IV Geothermal Development Project. The Town of Mammoth Lakes provides the following comments on the Draft EIS/EIR:

A. Project Description and Affected Environment

1. Chapter 2 of the EIS/EIR provides a description of the proposed project, including detailed information on potential power plant, wells, and pipelines to be constructed. The project description notes that new pipelines would be installed, which in some cases would parallel the existing pipeline. However, the project description is inadequate because it fails to describe the total number of pipes and cumulative width of pipelines that would ultimately be in place - in some instances this could be three or even four pipelines wide. The Town is concerned that this omission tends to understate the impacts of these wide barriers to recreationists, to wildlife, and on visual resources. The project description should be revised to fully describe and map the total number and width of all pipelines considering both existing and new pipes that would be installed with the project. The impact analysis throughout the document should be similarly revised to properly account for the impact of the total pipeline width. A4-1

2. Throughout Chapter 2 and 3 the document incorrectly indicates that Mono County maintains several roads including Sawmill Cutoff Road and Sawmill Road. Please clarify since Town records do not show the County maintaining any roads within the municipal boundary. The Town of Mammoth Lakes does maintain Sawmill Cutoff Road from SR203 to the end of the asphalt pavement near Shady Rest Park (O3S308). The Town also maintains Shady Rest Park access road (03S08N and 03S08P). A4-2

3. Section 1.5.3.2. should note that construction of buildings and other facilities within the Town of Mammoth Lakes Municipal Boundary may be subject to Town permitting requirements, including building permit and addressing requirements, unless exempted by the USFS. A4-3

B. Environmental Consequences

1. Air Quality

Section 4.2.4.2.a) concludes that the project would not conflict with the Town of Mammoth Lakes Air Quality Management Plan because the project would not include fires of any kind. However, a significant source of PM^{10} and $PM^{2.5}$ pollution in Mammoth Lakes is associated with re-entrained road dust and cinders, and directly correlates to the amount of vehicular traffic operating on local roads. Accordingly, an important control measure included in the Town's Air Quality Management Plan and associated Ordinance is to maintain total Vehicle Miles Travelled to less than 106,600 VMT. The analysis is insufficient because it does not include an assessment of the project's consistency with this control measure or the impacts of PM^{10} associated with vehicle road dust, or a quantification of VMT associated with the construction and operation of the project. A4-4

2. Land Use

Policy S.3.W. in the Town of Mammoth Lakes General Plan states: "If geothermal power generating facilities are developed on National Forest lands west of Highway 395, the Town shall work with the Mono County Local Agency Formation Commission (LAFCO) to review the municipal boundary and shall annex development if appropriate." The intent of this policy is to allow the Town to recoup property taxes and fees to offset the impacts of the geothermal operations on Town services. The EIS/EIR land use analysis fails to take note of this policy, does not analyze the project's conformance with it, nor the fiscal impacts of the project in the form of increased demand for Town services. (The analysis in Chapter 4.15 is limited to the fiscal benefits of the project, and does not discuss costs). A4-5

Since development of the CD-4 project would trigger the requirements of Policy S.3.W. it is the Town's position that the project applicant should bear the cost of preparing the LAFCO study called for by the General Plan, to determine if annexation of the land containing project facilities is appropriate.

3. Recreation

In the scoping letter submitted by the Town, many of the Town's comments focused on the potential impacts of the project on recreation, which is a major factor in our local economy and the quality of our local environment.

The scoping comments requested that alternatives looking at underground and at-grade crossings be analyzed. An alternative that would underground the entire pipeline was considered but rejected. The preferred alternative includes undergrounding of pipeline segments that cross Forest Service and other "official" roads. While the Town appreciates the effort to mitigate the impact of pipeline crossings on roads and recreational uses, we do not believe the analysis provides an adequate assessment of the impact on recreational uses, nor do any of the alternatives, mitigation measures or proposed PDMs fully address those impacts. The following recreation-related impacts are not properly analyzed or mitigated: A4-6

a. The installation of multiple pipelines, and widening of the footprint of existing pipelines will substantially change the recreation experience of motorized and non-motorized users of the Shady Rest Park trailhead. The introduction of new barriers may severely limit the use of this as a trailhead, because recreation options particularly from the trailhead to the south and west, will be impeded by the pipelines. A4-7

b. The mitigation measures and PDM's proposed do not fully mitigate the effect of the new and expanded pipeline system on trails and non-system roads because many of those routes would be blocked by pipeline crossings. Mitigation measures to underground pipelines wherever they cross any established trail or road, and not just system roads, should be added or an alternative considered that would underground additional segments of pipeline where they cross other roads and trails used for recreation purposes. A4-8

c. The effect of plowing roads for access to wellheads on over-snow recreation (motorized and non-motorized) is not analyzed. Crossing such plowed roads on skis or snowmobiles is likely to be extremely difficult and may be hazardous, particularly in heavy snow years when plowing can create large snow berms and grade changes between the road and adjacent areas. These impacts should be fully described and analyzed in the EIS/EIR. A4-9

d. The analysis focuses on effects on winter recreation, and does not provide an adequate assessment on effects on summer recreation, particularly the blocking of trails and non-system roads that would be caused by the additional pipelines. A4-10

e. As noted in Comment A.1. above, the impact analysis does not consider the fact that in some places three or four pipelines would be placed parallel to one another. The analysis should be revised to account for the additional obstacles and barriers presented by these extremely wide segments where multiple pipelines would run in parallel. A4-11

f. The analysis fails to quantify or provide a numeric estimate of the level of use of the trails and road system by recreationists in the winter and summers, resulting in an inadequate assessment of the impacts of the project on current and future users. A4-12

g. The EIS/EIR fails to analyze the effects of the project on the distribution and patterns of recreational use in the Shady Rest area. In particular, because of the obstacles and barriers presented by the new pipelines, motorized and non-motorized users will be funneled into similar areas, creating safety hazards and potential conflicts between the two. A4-13

h. The Town understands that a snowmobile concessionaire is currently in discussion with the Forest Service regarding location of operations in the Shady Rest Area. The impacts of introducing many new snowmobile trips, including by inexperienced riders, into this area, particularly with the constraints noted above, should be analyzed in the EIS/EIR. A4-14

i. The analysis of recreational impacts is inadequate because it does not account for changes in topography, trees, etc. in the Shady Rest Area that block short-range views and may make it difficult for trail users to anticipate encountering pipelines, well pads and fencing, sudden grade changes and other obstacles caused by the project. Such hazards and impacts should be discussed, and mitigation measures included to address them. A4-15

j. In its scoping comments, the Town requested an analysis of the rate of snowmelt associated with the pipelines that will be carrying hot geothermal fluid. Although the project description notes design features to insulate the pipes and prevent heat loss, no evidence or analysis is provided to demonstrate that areas above buried pipelines or adjacent to at grade pipes, will not be subject to an increased rate of snow melt. If there will be increased snowmelt (and it seems logical to assume that there would be) then the impacts and effects of this should be analyzed in the EIS/EIR. A4-16

4. Noise

The EIS/EIR provides an analysis of noise effects on Shady Rest Park, the Shady Rest Campgrounds, and other sensitive receptors, concluding, for both of those mentioned, that the A4-17

impacts would be less than significant. The Town does not agree with the analysis methodology or significance findings. A4-17 cont'd

a. Several well-heads, generating noise over 70dBA would be audible from Shady Rest Park. The EIS/EIR provides a conclusory statement that, because of the "typically" noisy activities that occur at Shady Rest Park, the noise impacts would not be significant. While there are some occasions when noisy sporting and other events take place at Shady Rest, for the majority of the day and throughout the year, park users enjoy a quiet environment and participate in a range of recreation activities that are not noisy. Because no existing ambient noise measurements were taken at Shady Rest Park, it is not possible to conclude that there would be no noise impact, nor that the effect on the noise environment is less than significant. A4-18

b. Furthermore, the threshold used in the study is not appropriate because it assumes the appropriate acceptable noise threshold the daytime and nighttime exterior noise standards for one and two family residences. Because of the nature of the facilities (a park in a rural setting, and a campground) the Town believes an alternate and lower threshold should be applied. The analysis also ignores other thresholds for noise impacts established in the Town of Mammoth Lakes Municipal Code. These standards determine there to be a significant increase in noise when operational noise sources increase ambient levels at the nearest receptors by more than 5dBA where ambient noise levels remain below the Town's Exterior Noise Standards and by 3 dBA when noise levels exceed the Town's Exterior Noise Levels. The study and analysis is inadequate because it fails to consider the proper thresholds, quantify the current ambient noise conditions at either the park or the campground, establish the change in noise levels associated with the proposed project, or use the proper significance threshold. A4-19

c. The cumulative noise effects of multiple wells operating, in proximity to Shady Rest Park, are not considered, and need to be included in the analysis. A4-20

d. Because no impacts to Shady Rest Park are identified, no mitigation measures are stated. The Town believes that if the noise analysis were properly conducted, noise impacts would be found to be significant. In such a case, appropriate mitigation measures, such as use of noise attenuating fencing or casing of well equipment to reduce noise, should be identified. A4-21

5. Transportation/Traffic

a. Sawmill Cutoff and the Shady Rest Park access roads were designed and constructed for use as seasonal, non-winter roads. The transportation analysis should analyze the impact of year-round use by vehicles serving the project facilities, and the increased use by the public taking advantage of the fact that these roads will now be open all year. The analysis should address the service life, long-term impact, and cost of maintenance to maintain these roads on a year round basis. Mitigation measures can then be developed from this analysis. A4-22

b. PDM TR6 states that "ORNI 50 LLC will attempt (emphasis added) to work with the Town of Mammoth Lakes and USFS to plow the road to and the parking lot at Shady Rest Park in the winter to better accommodate recreational traffic and parking for cross-country skiers and snowmobilers." The Town does not believe this measure provides sufficient certainty to the Town or USFS that plowed access will be maintained, and it is therefore A4-23

inadequate. PDM TR-6 should be revised to require ORNI 50, LLC to work with the Town to ensure that plowing and maintenance of these roads is performed at a level satisfactory to the Town and in compliance with all Town and Municipal Code requirements with regard to these Town-operated roads. A4-23 cont'd

c. The PDMs should also include measures that ORNI 50, LLC will obtain and comply with a Town Encroachment permit for all construction and access activities on Town maintained facilities. TR7. Sawmill Cutoff road has only 22 feet of paved width with very heavy traffic in the summer. The current speed limit is 25 mph, however, construction traffic should be limited to 15 mph in order to minimize conflicts between large construction vehicles and other users. A4-24

6. Visual Impacts

The evaluation of visual impacts focuses on views of pipelines from certain trails, including the Knolls Trail. The Town believes that the impact analysis both understates the visual impact of pipelines that can be seen from roads and trails, and presents mitigation measures (i.e. installation of screening vegetation) that will not fully address the visual impacts of the pipelines. Any new screening vegetation planted will take several years to become established, and even when grown, will be unlikely to be able to screen views from all public roads and trails. The impact analysis and significance finding should be revised to fully acknowledge the visual impacts of the project, which will be more extensive than stated in the EIS/EIR. A4-25

7. Surface and Groundwater Resources

a. Drainage Structures. The EIS/EIR concludes that there will be no impacts on surface erosion and surface waters. The Town operates sediment basins including the Shady Rest Park basin, Murphy Gulch 1 and Murphy Gulch 2 in the vicinity of the project to address runoff and non-point pollution sources. The document should discuss and analyze impacts of nonpoint stormwater pollution and impacts to sediment basins. Analysis should include increased use of the non-paved roads for year round access. A4-26

b. Groundwater. The Town has contemplated drilling an irrigation well at Shady Rest Park to reduce potable demands for the water system in Town. The report does not provide sufficient analyses on shallow groundwater impacts to determine what if any impacts there will be on local groundwater supplies. A4-27

c. The Town of Mammoth Lakes shares the concern of the Mammoth Community Water District and others regarding potential impacts of the project on groundwater resources. We understand that the District has significant concerns about the adequacy of the analysis and resulting findings with regard to impacts on water resources, and would echo and support any comments made by the District in that regard. A4-28

8. Socioeconomics

a. The analysis states that the new plant will only have 6 new full time employees. This number does not appear to be sufficient to provide staffing 24 hours a day 7 days a week for operations and emergency needs. A4-29

b. Section 3.15.1 seems to overstate the rental vacancy rate and does not discuss rental types or affordability, and how they would correspond to the wages for project workers. Many of the units in the Town of Mammoth Lakes and Mono County are second homes and are not available for long-term rental. Moreover, the rental vacancy rate varies considerably by season, with a greater shortfall of affordable rental units available in winter A4-30

months. The EIS/EIR should also provide an analysis on demand for campgrounds if workers are allowed to camp on USFS and campgrounds, and how this would affect the availability of campsites for recreational users. A4-31

We appreciate your consideration of these comments. Please contact Ellen Clark, Principal Planner (eclark@ci.mammoth-lakes.ca.us) if you have any questions regarding these comments.

Sincerely,

Matthew Lehman, Mayor
Town of Mammoth Lakes

Cc:
Greg Norby, General Manager, Mammoth Community Water District
Jon Regelbrugge, District Ranger, Inyo National Forest
Ted Schade, Executive Director, Great Basin Unified Air Pollution Control District

California Water Boards

Edmund G. Brown Jr.
Governor

Matthew Rodriquez
Secretary for
Environmental Protection

Lahontan Regional Water Quality Control Board

January 15, 2013

File: Environmental Doc Review
Mono County

Jan Sudomier
Great Basin Air Pollution Control District
157 Short Street
Bishop, CA 93514-3537
email: jan@gbuapcd.org

COMMENTS ON NOTICE OF PREPARATION OF A JOINT DRAFT ENVIRONMENTAL IMPACT STATEMENT AND ENVIRONMENTAL IMPACT REPORT FOR THE CASA DIABLO IV GEOTHERMAL DEVELOPMENT PROJECT, MONO COUNTY, STATE CLEARINGHOUSE NO. 2011041008

The California Regional Water Quality Control Board, Lahontan Region (Water Board) staff received the Public Draft Joint Environmental Impact Statement and Environmental Impact Report (Joint Draft EIS/EIR) for the above-referenced project (Project) on November 15, 2012. The Joint Draft EIS/EIR was prepared in accordance with the National Environmental Policy Act of 1969, as amended (NEPA), the Federal Land Policy and Management Act of 1976, as amended, and the California Environmental Quality Act of 1970 (CEQA). The Federal Bureau of Land Management (BLM) is the lead federal agency under NEPA and the United States Forestry Service (USFS) is a cooperating federal agency; the Great Basin Unified Air Pollution Control District (GBUAPCD) is the lead agency for review under CEQA. and submitted in compliance with provisions of the California Environmental Quality Act (CEQA). Water Board staff, acting as a responsible agency, is providing these comments to specify the scope and content of the environmental information germane to our statutory responsibilities pursuant to CEQA Guidelines, California Code of Regulations (CCR), title 14, section 15096. We hope that the agencies will consider our comments and value our position with respect to protecting and maintaining water quality in the Lahontan Region.

Project Description

The current owner/operator of the plant at Casa Diablo, known as ORNI 50, LLC, wants to expand its electricity generating capacity by installing up to 16 more geothermal wells and constructing another power plant. The Project involves building and operating a geothermal power plant (with a gross power output of 42.4 megawatts (MW), net power output of about 33 MW), a new substation, an overhead 33 kilovolts (kV) transmission line, a motive fluid system (n-pentane), one to two storage vessels in the range of 9,000 to 12,000 gallons, an air cooling system, a reverse osmosis (RO) water treatment facility and storage tank (treatment of geothermal brine for reuse), up to 16 geothermal wells

(final number to be determined after subsurface transport modeling and initial well yields once its obtained), associated pumps, tanks, valves, controls, flow monitoring equipment, geothermal pipelines, and a reclaimed wastewater pipeline. This Project also includes decommissioning of the power plant following the plants' 30-year operation. The air cooling system would rely on dry cooling year-round.

The Project would be located on public land managed by the BLM on leases No. CA-11667 and CA-11667A and in sections 29 and 32, Township 3 South, and Range 28 East Mount Diablo Baseline and Meridian. Most of the Project site is west of U.S. Highway 395 and north of State Route 203, about 0.5 miles northwest of the three existing Casa Diablo geothermal power plants, and about two miles east of the Town of Mammoth Lakes in Mono County; the remainder of the Project site is west of U.S. Highway 395, within 0.6 miles of the intersection of State Route 203 and U.S. Highway 395.

Authority

All groundwater and surface waters are considered waters of the State. All waters of the State are protected under California law. State law assigns responsibility for protection of water quality in the Lahontan Region to the Lahontan Water Board. Some waters of the State are also waters of the U.S. The Federal Clean Water Act (CWA) provides additional protection for those waters of the State that are also waters of the U.S.

The *Water Quality Control Plan for the Lahontan Region* (Basin Plan) contains policies that the Water Board uses with other laws and regulations to protect the quality of waters of the State within the Lahontan Region. The Basin Plan sets forth water quality standards for surface water and groundwater of the Region, which include designated beneficial uses as well as narrative and numerical objectives which must be maintained or attained to protect those uses. The Basin Plan can be accessed via the Water Board's web site at http://www.waterboards.ca.gov/lahontan/water_issues/programs/basin_plan/references.shtml.

The Project is located within the Owens Hydrologic Unit, Long Hydrologic Area (603.10), and includes the watersheds of Mammoth Creek, Hot Creek, and the Owens River. Water quality objectives and standards, both numerical and narrative, for waters of the State, including those within the Owens Hydrologic Unit, are outlined in Chapter 3 of the Basin Plan. Implementation of the proposed Project must comply with all applicable water quality standards and prohibitions, including provisions of the Basin Plan.

Permitting Requirements

A number of activities associated with the proposed Project appear to have the potential to impact waters of the State and, therefore, may require permits issued by either the

A5-1

Comment Letter A5

State Water Resources Control Board (State Water Board) or Lahontan Water Board. The required permits may include:

- Streambed alteration and/or discharge of fill material to a surface water, including water diversions, may require a CWA, section 401 water quality certification for impacts to federal waters (waters of the U.S.), or dredge and fill WDRs for impacts to non-federal waters, both issued by the Lahontan Water Board;

- Land disturbance of more than 1 acre may require a CWA, section 402(p) stormwater permit, including a National Pollutant Discharge Elimination System (NPDES) General Construction Stormwater Permit, Water Quality Order (WQO) 2009-0009-DWQ, obtained from the State Water Board, or individual stormwater permit obtained from the Lahontan Water Board;

- Discharge of low threat wastes to a surface water including, but not limited to, diverted stream flows, construction and/or dredge spoils dewatering, and well construction and hydrostatic testing discharge, may be subject to discharge and monitoring requirements under either NPDES General Permit, Limited Threat Discharges to Surface Waters, Board Order R6T-2008-0023, issued by the Water Board; and

- Discharge of low threat wastes to land, including clear water discharges, small dewatering projects, and inert wastes, may be subject to discharge and monitoring requirements under General Waste Discharge Requirements for Discharges to Land with a Low Threat to Water Quality, WQP-2003-0003, issued by the Lahontan Water Board.

A5-1 cont'd

We request that the Joint Draft EIS/EIR list the permits that may be required, as outlined above, and identify the specific activities that may trigger these permitting actions in the appropriate sections of the Joint Draft EIS/EIR. Information regarding these permits, including application forms, can be downloaded from our web site at http://www.waterboards.ca.gov/lahontan/.

Potential Impacts to Waters of the State

The Joint Draft EIS/EIR must evaluate the Project's potential impact to water resources, water quality, and hydrology. Please note that obtaining a permit and conducting monitoring does not constitute adequate mitigation. Development and implementation of acceptable mitigation is required. The Joint Draft EIS/EIR must specifically describe the best management practices and other mitigation measures used to mitigate for Project impacts, and should address the following.

A5-2

Delineation of Surface Waters

The Project area is traversed by many named and unnamed ephemeral streams. In addition to the Owens River, Mammoth Creek, and Hot Creek, numerous springs and seeps and associated wetlands exist around the Project site. A full delineation of

surface water resources must be performed in order to evaluate all potential Project impacts to water quality and hydrology.

As previously stated, all surface waters are waters of the State. Some waters of the State are "isolated" from waters of the U.S. Determinations of the jurisdictional extent of the waters of the U.S. are made by the United States Army Corps of Engineers (USACE). Projects that have the potential to impact surface waters will require the appropriate jurisdictional determinations from the USACE. We request that the Project proponent consult with the USACE and the Water Board when performing the necessary jurisdictional determinations for surface waters within the Project area to ensure that the full extent of both state and federal jurisdictional areas are accurately documented. Please note that the Water Board may find waters of the State to be greater in extent than the Corps jurisdictional limits, especially in cases where the USACE's use of ordinary high water mark does not extend to the full reach of waters at the site.

A5-2 cont'd

In areas where USACE does not take jurisdiction, the Water Board generally delineates waters of the State based on distinct geomorphic flow indicators with or without clearly definable bed and bank features. Clearly definable bed and bank features are not the only consideration. In particular, presence or absence of "blue-line" streams on maps is not a reliable indicator of jurisdiction. Many small, ephemeral drainages that are not represented as blue-line features on topographic maps and lack riparian vegetation may still be considered waters of the State and subject to Water Board jurisdiction.

Please keep in mind that when delineating waters of the State, the presence or absence of traditionally "riparian vegetation" is typically **not** a reliable indicator of riparian zones in arid regions of California. In these areas, often times the upland and riparian zones have similar vegetative communities with only subtle differences in plant density or species distribution serving as key indicators of riparian functions.

Beneficial Uses

The surface waters located within the vicinity of the Project site are within the Owens Hydrologic Unit, Long Hydrologic Area (603.10), and includes the watersheds of Mammoth Creek, Hot Creek, and the Owens River, and are identified in the Basin Plan as rivers, springs, minor surface waters, and minor wetlands. Beneficial uses, either past, present, or future, associated with these surface waters include municipal and domestic supply (MUN), agricultural supply (AGR), industrial service supply (IND), groundwater recharge (GWR), navigation (NAV), freshwater replenishment (FRSH), rare, threatened, or endangered species (RARE), migration of aquatic organisms (MIGR), water contact recreation (REC-1), non-contact water recreation (REC-2), commercial and sport fishing (COMM), aquaculture (AQUA), cold freshwater habitat (COLD), wildlife habitat (WILD), spawning, reproduction, and development (SPWN), water quality enhancement (WQE) and flood peak attenuation / flood water storage (FLD).

A5-3

Comment Letter A5

The groundwater beneath the Project site is within the Long Valley Groundwater Basin (number 6-11). The beneficial uses assigned to the groundwater include MUN, AGR, IND, and FRSH.

Water quality objectives and standards, both numerical and narrative, for both surface waters and groundwater, are outlined in Chapter 3 of the Basin Plan. Implementation of the proposed Project must comply with all applicable water quality standards and prohibitions, including provisions of the Basin Plan.

We request that the Joint Draft EIS/EIR identify and list the beneficial uses of the water resources within the Project area. An analysis of the Project's potential impacts to water quality with respect to those beneficial uses must be included in the Joint Draft EIS/EIR. Alternatives to avoid those impacts should be considered. Specific mitigation measures must be identified that, when implemented, minimize unavoidable impacts to a less than significant level.

A5-3 cont'd

Degradation Analysis, State Board Resolution 68-16

The State Water Board established California's anti-degradation policy in State Water Board Resolution No. 68-16 for both surface waters and groundwater. That policy requires that whenever the existing quality of water is better than the quality established in policies as of the date on which such policies become effective, such existing high quality waters will be maintained until it has been demonstrated to the State that any change will be consistent with maximum benefit to the people of the State, will not unreasonably affect present and anticipated beneficial use of such water and will not result in water quality less than that prescribed in the policies. If degradation is proposed, the proposed discharge that results in degradation must be treated using best practical control technology such that 1) pollution or nuisance will not occur, and 2) that the highest water quality consistent with maximum benefit to the people of the State will be maintained. The Water Board's Basin Plan implements, and incorporates by reference, the State anti-degradation policy.

A5-4

The Joint Draft EIS/EIR must characterize the existing, ambient water quality of groundwater beneath the site and compare that to the known water quality of the import water to be injected. A Degradation Analysis, consistent with State Board Resolution 68-16, must be performed to quantify what, if any, degradation of existing groundwater resources will occur with Project implementation. The results of that analysis must be included in the environmental review.

Hydrology

In general, installation of new roads, well pads, piping, and a power plant have the potential to hydrologically modify natural drainage systems. The Joint Draft EIS/EIR must provide specific information regarding the potential impacts to surface waters with respect to the proposed activities. The Joint Draft EIS/EIR must describe and quantify all impacts to surface waters and identify whether those impacts are either permanent or temporary. The Joint Draft EIS/EIR should identify alternatives and other mitigation measures to reduce and/or eliminate such impacts. If impacts are unavoidable, then we request that the impacts be minimized to the extent practical and that the Project be

A5-5

Comment Letter A5

designed such that it would maintain existing hydrologic features and patterns to the extent feasible. All unavoidable impacts to waters of the State must be mitigated to ensure that no net loss of function and value will occur as a result of Project implementation.

A5-5 cont'd

Stormwater

Because increased runoff from developed areas is a key variable driving a number of other adverse effects, attention to maintaining the pre-development hydrograph will prevent or minimize many problems and will limit the need for other analyses and mitigation. Therefore, post-construction stormwater management must be considered a significant component in the environmental review process. Of particular concern is the collection and concentration of stormwater runoff into channels and the discharge of that stormwater to natural drainage systems. Without adequate design, the consequences of combining these flows will likely be degradation to the existing natural drainage channel both upstream and downstream from the confluence. The Joint Draft EIS/EIR must evaluate all potential stormwater impacts, particularly potential post-construction hydrologic impacts, and describe specific mitigation measures that, when implemented, will reduce those potential impacts to a less than significant level. Where feasible, we request that design alternatives be considered that direct captured runoff away from surface waters to areas where it will dissipate by percolation into the landscape. For example, a spreader system constructed at the downstream end of an engineered channel would act to return concentrated flows to sheet-flow conditions.

A5-6

Cumulative Impacts to Waters of the State

Watersheds are complex natural systems in which physical, chemical, and biological components interact to support the beneficial uses of water. Poorly planned development and redevelopment upsets these natural interactions and degrades water quality through a network of interrelated effects. The primary impacts of poorly planned development and redevelopment projects on water quality are:

- Direct, indirect, and cumulative impacts – plans must include a comprehensive analysis of the direct, indirect, and cumulative physical impacts of filling and excavation of wetlands, riparian areas, and other waters of the State, performed from the site to the watershed level;
- Pollutants – the generation of pollutants during and after construction;
- Hydrologic modification – the alteration of flow regimes and groundwater; and
- Watershed-level effects – the disruption of watershed-level aquatic function, including pollutant removal, floodwater retention, and habitat connectivity.

A5-7

These impacts have the potential to degrade water quality and impair a number of beneficial uses by reducing the available riparian habitat and eliminating the natural buffer system to filter runoff and enhance water quality. These impacts typically result

in hydrologic changes by decreasing water storage capacity and increasing water flow velocity, which in turn leads to increases in the severity of peak discharges. These hydrologic changes may ultimately lead to near-total loss of natural functions and values, resulting in the increased need for engineered solutions to re-establish the disrupted flow patterns. Many examples of such degradation exist in California and elsewhere. The Water Boards are mandated to prevent such degradation.

A5-7 cont'd

Thank you for the opportunity to comment on the Joint Draft EIS/EIR. If you have any questions regarding this letter, please contact me at (760) 241-7391 (tbrowne@waterboards.ca.gov) or Patrice Copeland, Senior Engineering Geologist, at (760) 241-7404 (pcopeland@waterboards.ca.gov).

Sincerely,

Tom Browne, PhD, PE
Water Resource Control Engineer

cc: State Clearinghouse, Sacramento, CA
(SCH No. 2011041008) (via email, state.clearinghouse@opr.ca.gov)

Bruce Henderson, US Army Corps of Engineers
(via email, bruce.a.henderson@usace.army.mil)

Tammy Branston, California Department of Fish and Wildlife
(via email, tbranston@dfg.ca.gov)

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Reinhardt, Collin <creinhardt@blm.gov>

RE: Casa Diablo IV Geothermal Development Project Draft EIS/EIR Available

1 message

Truschel, Jack@DOC <Jack.Truschel@conservation.ca.gov> Mon, Jan 28, 2013 at 8:40 AM
To: "DeRose, Margie B -FS" <mbderose@fs.fed.us>
Cc: "Reinhardt, Collin B (creinhardt@blm.gov)" <creinhardt@blm.gov>, "Lagomarsino, Adele@DOC" <Adele.Lagomarsino@conservation.ca.gov>, "Johnson, Liz@DOC" <Liz.Johnson@conservation.ca.gov>

Margie,

Thanks for sending us a draft copy of the project EIS/EIR. Because there are no plans for drilling any of the proposed wells on State or private lands, CA DOGGR has no comments. A6-1

Sincerely,

Jack Truschel

Geothermal District Engineer

Division of Oil, Gas, & Geothermal Resources

801 K Street, Sacramento, CA 95814

916.323.1787

Email: jtrusche@consrv.ca.gov

From: DeRose, Margie B -FS [mailto:mbderose@fs.fed.us]
Sent: Wednesday, January 09, 2013 8:45 AM
To: Truschel, Jack@DOC
Cc: Reinhardt, Collin B (creinhardt@blm.gov)
Subject: Casa Diablo IV Geothermal Development Project Draft EIS/EIR Available

Hi Jack,

I wanted to let you know that the Casa Diablo IV Geothermal Development Project Draft EIS/EIR is available for review. The comment period closes January 30th. I realized this morning that we sent a notice to Tim Boardman

at CA DOGGR, but not you.

The document and appendices are available here:

http://www.blm.gov/ca/st/en/prog/energy/fasttrack/casadiablo/fedstatus.html

If you have any questions, feel free to contact me or Collin Reinhardt at BLM (760) 872-5024 creinhardt@blm.gov.

Thank you,

Margie

Margie B. DeRose, P.G.

Minerals & Geology Program Manager

Inyo National Forest

351 Pacu Lane, Suite 200

Bishop, CA 93514

Office: (760) 873-2424

Cell: (760) 258-7744

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mbderose@fs.fed.us

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Mono County
Community Development Department

PO Box 347
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760.924.1800, fax 924.1801
commdev@mono.ca.gov

PO Box 8
Bridgeport, CA 93517
760.932.5420, fax 932.5431
www.monocounty.ca.gov

Collin Reinhardt
Bureau of Land Management
Bishop Field Office
351 Pacu Lane, Suite 100
Bishop, CA 93514

RECEIVED FEB 0 1 2013

Attn: Casa Diablo IV Geothermal Development Project

January 29, 2013

Dear Mr. Reinhardt:

Thank you for the opportunity to review the Joint Draft Environmental Impact Statement/Environmental Impact Report (EIR/EIS) for the Casa Diablo IV Geothermal Development Project (the "Project").

Mono County's primary comment on the document relates to the involvement of private lands in the Project. In public scoping and information meetings, Mono County was informed that the Project would not utilize private land. However, upon review of the Draft document, it appears this is not the case. For example, Figure 1-3 suggests that both a single and double pipeline will cross APN 037-050-002 and a double pipeline will potentially cross LADWP lands on APN 037-050-001.

It is requested that greater detail be provided specifically describing project components on lands subject to Mono County land use planning purview, including any specific environmental impacts and associated mitigation measures. In particular, any amendments to existing planning permits, such as use permits and reclamation requirements should be specified. To assist in clarifying these impacts, we request that the project consultants meet with our staff and review existing regulations, permits and environmental requirements applicable to impacted private properties. This will help assure that Mono County is fulfilling its role as a responsible agency under the California Environmental Quality Act.

A7-1

In addition to the foregoing, the County has the following comments:

1. Reference to an "Energy Development Department" in the County is incorrect and should be changed to Economic Development Department. A7-2
2. Figure 1-3 shows proposed single and double pipelines crossing the private property where the current MP-1 plant is located. It is unclear where or whether there may be three pipelines paralleling each other on this property, please explain or illustrate this. A7-3

3. In reference to any new proposed paralleling pipelines please indicate the distance between them to assure there is safe passage for wildlife. A7-4
4. Any pipelines installed under County roads will require an encroachment permit from the County. A7-5
5. Any County road closure will need to be approved by Mono County in advance. A7-6
6. Approval by Mono County will be necessary to plow county roads. A7-7
7. Mono County will need to review and approve any reroute of Sawmill Road near well head 50-25. A7-8
8. It is also recommended that the plant and associated pipelines be painted in dark earth green colors, rather than the proposed neutral, to reduce any visual impacts from the Scenic Corridor US Highway 395. A7-9

Again, thank you for the opportunity to review the document. We look forward to clarifying impacts to private property and local permit requirements. Please call Associate Planner Courtney Weiche (760) 924-1803 or Principal Planner Gerry LeFrancois (760) 924-1810 if you have any questions concerning these comments.

Sincerely,

Scott Burns
Director

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION IX
75 Hawthorne Street
San Francisco, CA 94105-3901

JAN 30 2013

Collin Reinhardt
Bureau of Land Management
Bishop Field Office
351 Pacu Lane, Suite 100
Bishop, California 93514

Subject: Draft Environmental Impact Statement for the Casa Diablo IV Geothermal Development Project, Mono County, CA (CEQ# 20120362)

Dear Mr. Reinhardt:

The U.S. Environmental Protection Agency has reviewed the above-referenced document pursuant to the National Environmental Policy Act, Council on Environmental Quality regulations (40 CFR Parts 1500-1508), and our NEPA review authority under Section 309 of the Clean Air Act.

EPA has rated the Draft Environmental Impact Statement as EC-2, Environmental Concerns – Insufficient Information (see enclosed "*Summary of Rating Definitions*"). Although we support many elements of the Preferred Alternative, we are concerned about potential direct and cumulative impacts to sensitive wetland and riparian resources. The enclosed Detailed Comments elaborate on the above concerns and provide additional recommendations regarding protection of air quality and biological resources.

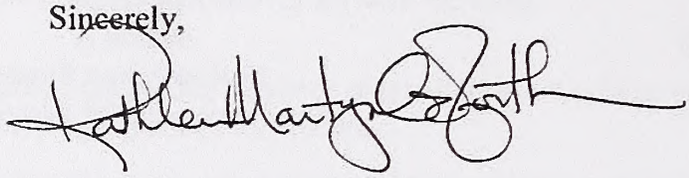
On a positive note, we commend BLM on the very thorough and informative discussion of greenhouse gas emissions and climate change in the DEIS.

Please note that, as of October 1, 2012, EPA Headquarters no longer accepts paper copies or CDs of EISs for official filing purposes. Submissions on or after October 1, 2012, must be made through the EPA's new electronic EIS submittal tool: *e-NEPA*. To begin using *e-NEPA*, you must first register with the EPA's electronic reporting site - https://cdx.epa.gov/epa_home.asp. Electronic submission does not change requirements for distribution of EISs for public review and comment, and lead agencies should still provide one hard copy of each Draft and Final EIS released for public circulation to the EPA Region 9 office in San Francisco (Mail Code: CED-2). A8-1

We appreciate the opportunity to review this DEIS. When the FEIS is released for public review, please send one (1) hard copy and one (1) CD ROM to the address above (mail code: CED-2). If you have any questions, please contact me at (415) 972-3521 or Scott Sysum, the lead reviewer for this project, at (415) 972-3742 or sysum.scott@epa.gov.

Printed on Recycled Paper

Sincerely,



Kathleen Martyn Goforth
Manager
Environmental Review Office (CED-2)
Communities and Ecosystems Division

Enclosures:
(1) Summary of EPA Rating Definitions
(2) EPA's Detailed Comments

SUMMARY OF EPA RATING DEFINITIONS*

This rating system was developed as a means to summarize the U.S. Environmental Protection Agency's (EPA) level of concern with a proposed action. The ratings are a combination of alphabetical categories for evaluation of the environmental impacts of the proposal and numerical categories for evaluation of the adequacy of the Environmental Impact Statement.

ENVIRONMENTAL IMPACT OF THE ACTION

"LO" (Lack of Objections)

The EPA review has not identified any potential environmental impacts requiring substantive changes to the proposal. The review may have disclosed opportunities for application of mitigation measures that could be accomplished with no more than minor changes to the proposal.

"EC" (Environmental Concerns)

The EPA review has identified environmental impacts that should be avoided in order to fully protect the environment. Corrective measures may require changes to the preferred alternative or application of mitigation measures that can reduce the environmental impact. EPA would like to work with the lead agency to reduce these impacts.

"EO" (Environmental Objections)

The EPA review has identified significant environmental impacts that should be avoided in order to provide adequate protection for the environment. Corrective measures may require substantial changes to the preferred alternative or consideration of some other project alternative (including the no action alternative or a new alternative). EPA intends to work with the lead agency to reduce these impacts.

"EU" (Environmentally Unsatisfactory)

The EPA review has identified adverse environmental impacts that are of sufficient magnitude that they are unsatisfactory from the standpoint of public health or welfare or environmental quality. The EPA intends to work with the lead agency to reduce these impacts. If the potentially unsatisfactory impacts are not corrected at the final EIS stage, this proposal will be recommended for referral to the Council on Environmental Quality.

ADEQUACY OF THE IMPACT STATEMENT

Category "1" (Adequate)

The EPA believes the draft EIS adequately sets forth the environmental impact(s) of the preferred alternative and those of the alternatives reasonably available to the project or action. No further analysis or data collection is necessary, but the reviewer may suggest the addition of clarifying language or information.

Category "2" (Insufficient Information)

The draft EIS does not contain sufficient information for EPA to fully assess environmental impacts that should be avoided in order to fully protect the environment, or the EPA reviewer has identified new reasonably available alternatives that are within the spectrum of alternatives analyzed in the draft EIS, which could reduce the environmental impacts of the action. The identified additional information, data, analyses, or discussion should be included in the final EIS.

Category "3" (Inadequate)

The EPA does not believe that the draft EIS adequately assesses potentially significant environmental impacts of the action, or the EPA reviewer has identified new, reasonably available alternatives that are outside of the spectrum of alternatives analyzed in the draft EIS, which should be analyzed in order to reduce the potentially significant environmental impacts. EPA believes that the identified additional information, data, analyses, or discussions are of such a magnitude that they should have full public review at a draft stage. EPA does not believe that the draft EIS is adequate for the purposes of the NEPA and/or Section 309 review, and thus should be formally revised and made available for public comment in a supplemental or revised draft EIS. On the basis of the potential significant impacts involved, this proposal could be a candidate for referral to the CEQ.

*From EPA Manual 1640, Policy and Procedures for the Review of Federal Actions Impacting the Environment.

US EPA DETAILED COMMENTS ON THE DRAFT ENVIRONMENTAL IMPACT STATEMENT FOR THE CASA DIABLO IV GEOTHERMAL DEVELOPMENT PROJECT, MONO COUNTY, CA, JANUARY 29, 2013

Waters of the United States

Clean Water Act Section 404

The Draft Environmental Impact Statement states that there are 1.89 acres of potentially jurisdictional wetlands in close proximity of the existing power plant facilities (p. 3.3-11). The DEIS also states that construction of the project facilities near potentially jurisdictional features may result in a discharge of sediments downstream of the construction sites. Increased sedimentation to these features could lead to decreases in water quality and subsequent impacts to the biological community dependent on them. Implementation of Project Design Measure HYD-1, which would require appropriate erosion control measures and United States Forest Service best management practices to prevent soil erosion, would reduce these indirect impacts to potentially jurisdictional features. It is unclear from the discussion whether or not jurisdictional waters of the U.S. will be impacted. Also, the listing of agency required permits in section 1.6 does not indicate the need for a Clean Water Act Section 404 permit (p. 1-14). A8-2

Recommendations:

The FEIS should include a table and clear narrative describing and comparing, among the alternatives, the direct, indirect/secondary and temporary impacts to waters, including wetlands, if any.

If there would be impacts to jurisdictional waters, include an estimate of type(s) and acreage, and a discussion of impact avoidance measures, mitigation availability, and compliance with the Clean Water Act Section 404(b)(1) Guidelines and Mitigation Rule.

Water Quality

According to Project Design Measure HYD-9, the project will employ conventional drilling methods and will require the construction of containment basins/sumps at each drill site for the containment and temporary storage of all drilling fluid, drilling mud and cuttings and stormwater runoff. The basins/sumps will be constructed to meet Regional Water Quality Control Board requirements. Upon completion of drilling activities, the solids remaining in the pit will be dried and tested in accordance with State regulations and, if authorized by the Regional Water Quality Control Board, USFS and Bureau of Land Management, buried in the pit.

The challenges associated with conventional drilling containment basins/reserve pits include the volume of drilling wastes; drill site installation and restoration costs; pollution of land and/or surface water due to failure of pits and/or containment system and associated cleanup costs; management and inspection/monitoring costs; potential for mortality to birds and other animals that may be attracted to the water; and potential for subsurface pollution due to downward migration from pits and/or surface soil permeability. A8-3

An alternative is pitless or closed loop drilling methods, which do not require the construction and management of a reserves pit, and storage of produced fluids in Baker Tanks. A closed loop system offers a drilling site both de-watering and wastewater management. The process involves separating solids from liquids, using both mechanical means (shaking and screens) and chemical means. A centrifuge spins the water out of the solids. The gravel-like solids, drill cuttings, are dried and then – if they are not contaminated – used to construct access roads or new well pads. The water is stored for re-

use in the drilling process. "According to the EPA, drillers using this method see an 80 percent reduction in use of water." Also the BLM "Gold Book", which provides Best Management Practices for drilling, endorses this zero discharge process[1].

Recommendations:
The FEIS should include a discussion of pitless or closed loop drilling methods that do not require the construction and management of a reserves pit. An analysis of costs or other reasonable explanation should be provided if the developer chooses not to use closed loop drilling.

If used, reserve pit design and management should also comply with the BLM "Gold Book" best management practices.

A8-3 cont'd

Air Quality

Fugitive Emissions and Diesel Exhaust Mitigation
EPA commends the USFS and the BLM for incorporating fugitive dust control measures to limit impacts from particulate matter 10 microns or less in size (PM_{10}), and mitigation measures to address exhaust emissions. Although EPA supports incorporating such mitigation strategies, we advocate minimizing disturbance to the natural landscape as much as possible so that the need for measures to reduce fugitive dust is eliminated or minimized. Implementation of additional mitigation measures could reduce the Project's emissions.

Recommendations:
The EPA recommends that the FEIS include the following additional measures to reduce emissions of criteria air pollutants and hazardous air pollutants (air toxics):

- Reduce land disturbance activities as much as possible so that natural, stable soil conditions remain.
- Post visible speed limit signs at construction site entrances.
- Develop a construction traffic and parking management plan that maintains traffic flow and plan construction to minimize vehicle trips.
- Include provisions for monitoring fugitive dust in the fugitive dust control plan and initiate increased mitigation measures to abate any visible dust plumes.

A8-4

Sensitive Receptors
The DEIS states that there are no sensitive receptors (e.g., schools, hospitals, daycare centers, long-term care facilities, residences) located within the immediate vicinity of the Proposed Action or alternative sites. However, Shady Rest Park, a Town of Mammoth Lakes sports complex, is approximately 160 feet southeast of proposed Well Site 38-25. Elsewhere in the DEIS it is stated that the closest sensitive receptor to a CD-IV Project site is the Shady Rest Campground, approximately 0.5 mile to the west-southwest of Well Site 38-25, and the closest residences are along Trails End Road, approximately 0.8 mile southwest of Well Sites 38-25 and 50-25 (p. 4.2-3). The DEIS states in the well drilling section that well drilling will take place 24 hours a day, 7 days a week for a total of 60 days. After drilling, flow testing will be performed, which can release non-condensable gases, including Hydrogen Sulfide.

A8-5

[1] United States Department of the Interior and United States Department of Agriculture. 2007. Surface Operating Standards and Guidelines for Oil and Gas Exploration and Development. BLM/WO/ST-06/021+3071/REV 07. Bureau of Land Management. Denver, Colorado. 84 pp.

The EPA considers facilities that house or attract children, the elderly, or people with illnesses or others who are especially sensitive to the effects of air pollutants to be sensitive receptors.

Recommendation:
The FEIS should consider the Shady Rest Park, Shady Rest Campground and nearby residences as sensitive receptors, and evaluate the potential impacts on them accordingly.

A8-5 cont'd

Hydrogen Sulfide Emissions
The DEIS states that, during well cleanout and flow testing, geothermal fluids would likely be pumped into large open containers and H_2S may temporarily be released from the geothermal fluid for several hours during these activities. The local H_2S emissions during these activities could exceed the Great Basin Unified Air Pollution Control District H_2S emissions standard of 2.5 kg/hr/source and could produce an objectionable "rotten egg" odor in the immediate vicinity of each well. However, according to the DEIS, these concentrations would not be expected to pose a health hazard and would not reach far beyond the vicinity of the well under normal conditions. On page 4.2-10 the DEIS states that potential H_2S emissions resulting from these activities would be temporary at each well development site and would occur for a relatively short period of several hours; however on page 2-27 the DEIS states that flow testing could be short term up to 24 hours or long term for up to 30 days.

Recommendation:
The FEIS should clarify the apparent inconsistencies in the impact analysis with regards to well flow testing. The FEIS should include an H_2S emissions monitoring plan and explain how the applicant will demonstrate that the facility is in compliance with the GBUAPCD H_2S emissions limits and the California Ambient Air Quality Standard for hydrogen sulfide of 0.03 ppm (30 ppb, 42 mg/m3) for one hour.

A8-6

Biological Resources

The DEIS states that, under the Proposed Action, direct effects to migratory bird habitat include the removal of trees and shrubs to develop the power plant, transmission line, substation, well pad sites and pipeline routes. There is no mention of the potential impact to migratory birds from the new power line.

Recommendations:
The FEIS should include assurances that the design of the transmission line would be in compliance with current standards and practices that reduce the potential for migratory bird fatalities and injuries. The commonly referenced source of such design practices is found within the Avian Power Line Interaction Committee documents: *Suggested Practices for Avian Protection on Power Lines: State of the Art in 2006* manual and *Mitigating Bird Collisions with Power Lines: The State of the Art in 1994.*

A8-7

State of California – Natural Resources Agency
DEPARTMENT OF FISH AND WILDLIFE
Inland Deserts Region
407 West Line Street
Bishop, CA 93514
www.wildlife.ca.gov

Comment Letter A9

EDMUND G. BROWN JR., Governor
CHARLTON H. BONHAM, Director

January 30, 2013

Collin Reinhardt, Project Manager
Bureau of Land Management
351 Pacu Lane, Suite 100
Bishop, CA 93514

by email: cabipubcom@blm.gov

Subject: Draft DEIS/EIR for Casa Diablo IV Geothermal Development Project, Mono County, SCH No. 2011041008

Dear Mr. Reinhardt,

The Department of Fish and Wildlife (Department) has reviewed the Draft Environmental Impact Statement Report (DEIS/EIR) for the Casa Diablo IV Geothermal Development Project (Project) relative to impacts to biological resources. The proposed project would construct, operate, maintain and decommission a 33 megawatt (MW) geothermal power generating facility and related infrastructure near Mammoth Lakes in Mono County, CA.

The Department is providing comments on the DEIS/EIR as the State agency which has the statutory and common law responsibilities with regard to fish and wildlife resources and habitats. California's fish and wildlife resources, including their habitats, are held in trust for the people of the State by the Department (Fish and Game Code s711.7). The Department has jurisdiction over the conservation, protection, and management of fish, wildlife, native plants, and the habitats necessary for biologically sustainable populations of those species (Fish and Game Code s1802). The Department's fish and wildlife management functions are implemented through its administration and enforcement of Fish and Game Code (Fish and Game Code s702). The Department is a trustee agency for fish and wildlife under the California Environmental Quality Act (see CEQA Guidelines, 14 Cal. Code Regs. §15386(a)). The Department is providing these comments in furtherance of these statutory responsibilities, as well as its common law role as trustee for the public's fish and wildlife.

The Department offers the following comments and recommendations:

1. As described below, the Department believes the DEIS/EIR requires substantial revisions. Mitigation measures have not been fully developed for the Department to determine whether project impacts will be reduced below a level of significance. Additional analyses need to be conducted in regard to biological resources. Without the additional information requested below, the Department believes that the project could result in other potentially significant environmental impacts. Consistent with section 15073.5 of the CEQA Guidelines, the Department recommends that the DEIS/EIR be revised and re-circulated for public comment and review. A9-1

2. As described in the DEIS/EIR "...the CD-IV project is forecast to reduce the thermal outflow to Hatchery Springs by about 17 percent..." The final DEIS/EIR should include an analysis of expected changes in the hatchery springs on Owens tui chub growth, reproduction and habitat. A9-2

3. The proposed Mitigation Measure GEO-5 is not defined in the DEIS/EIR. The measure suggests the project would become subject to certain conditions equal to those which now govern existing geothermal plants which adjoin the proposed project site. Any mitigation proposed as part of the Project, including monitoring and reporting, must be specifically disclosed within the DEIS/EIR. Reference to external documents, especially those which may be modified in the future at the discretion of the lead agency, neither discloses nor establishes feasible mitigation. A9-3

4. Cumulative Impacts. Pursuant to CEQA Guidelines Section 15130, the DEIS/EIR should include a thorough discussion of direct, indirect, and cumulative impacts expected to adversely affect biological resources. Cumulative impacts are defined as individually minor but collectively significant actions taking place over a period of time. Specific measures to offset such impacts should be included. The DEIS/EIR should present clear thresholds of significance in its determination of the significance of environmental effects. A threshold of significance is an identifiable quantitative, qualitative or performance level of a particular environmental effect. Project impacts should be analyzed relative to their effects on off-site habitats. This may include public lands, open space, or any other natural habitat that could be affected by the project. Specifically, the Department requests a thorough discussion of the cumulative effects of all geothermal operations in the project vicinity, including effects on spring flow, temperature, water quality, and Owens tui chub and their habitat. A9-4

Thank you for this opportunity to comment. Questions regarding this letter and further coordination on these issues should be directed to Mr. Steve Parmenter, Staff Environmental Scientist, at (760) 872-1123.

Sincerely,

Steve Parmenter

for Debra Hawk
Habitat Conservation Supervisor

cc: Nancee Murray, Senior Staff Counsel
State Clearinghouse
Chron

January 30, 2013

VIA ELECTRONIC MAIL: cabipubcom@blm.gov

Mr. Collin Reinhardt, Project Manager
Casa Diablo IV Geothermal Development Project
U.S. Bureau of Land Management, Bishop Field Office
351 Pacu Lane, Suite 100
Bishop, California 93514

Re: Mammoth Community Water District Comments on Casa Diablo IV Geothermal Development Project Draft EIS/EIR

Dear Mr. Reinhardt:

The Mammoth Community Water District (MCWD) submits the following preliminary comments on the Casa Diablo IV Geothermal Development Project (Project) Draft EIS/EIR (Draft EIS/EIR). As you are aware, MCWD requested an extension for submitting its comments in order to fully evaluate the Project's potential environmental impacts. The Great Basin Unified Air Pollution Control District (GBUAPCD), the lead agency for compliance with the California Environmental Quality Act (CEQA), confirmed that it will extend its comment period for MCWD until February 20, 2013. The U.S. Bureau of Land Management (BLM), however, has declined to provide such an extension to MCWD, stating that it will consider comments that are provided by MCWD after the January 30, 2013 deadline "to the extent practicable." BLM's refusal to extend MCWD's comment period is disappointing in view of the fact that BLM has not yet provided MCWD with additional information about the Project pursuant to MCWD's Public Records Act/Freedom of Information Act request dated January 11, 2013. (BLM did provide a 36-page technical peer review report evaluating the model used to analyze some of the Project's impacts to MCWD only yesterday afternoon, the day before the comment deadline.) MCWD will provide supplemental comments as soon as it receives, and completes its review of, the additional information requested from BLM and ORNI 50 LLC, the Project proponent. MCWD appreciates the opportunity to submit these comments, and greatly appreciates GBUAPCD's cooperation in extending its comment period under CEQA.

A10-1

MCWD provides the Town of Mammoth Lakes and surrounding areas with safe, reliable and affordable municipal water supply, wastewater collection and treatment, and recycled water supply services. MCWD's primary areas of concern regarding the Draft EIS/EIR involve the Project's potential impacts to regional hydrology and groundwater resources. MCWD believes the Draft EIS/EIR is inadequate because it lacks critical information necessary to form proper conclusions regarding the Project's potential impacts. Simply put, there is no substantial evidence in the Draft EIS/EIR and its appendices to support the significance conclusions pertaining to potential impacts on the resources of concern to MCWD. This assessment is based on the review of the Draft EIS/EIR conducted by MCWD staff and its hydrogeology consultants, Mark Wildermuth and Wenbin Wang of Wildermuth Environmental Inc. and Ken Schmidt of Kenneth D. Schmidt and Associates. Mr.

A10-2

Wildermuth's, Mr. Wang's and Mr. Schmidt's comments are attached to this letter and are incorporated herein as part of MCWD's comments. Their resumes also are attached for your review. A10-2 cont'd

I. Why MCWD Is Concerned about the Project

MCWD uses a combination of surface water and groundwater to meet water demands within its service area. Surface water supply is provided for under two licenses (Licenses 5713 and 12593) and one permit (Permit 17332) issued by the State Water Resources Control Board (SWRCB). Pursuant to these appropriative rights, MCWD diverts and stores water at Lake Mary, tributary to Mammoth Creek thence Hot Creek thence Owens River. Such diversions are subject to certain streamflow requirements measured at two compliance points along Mammoth Creek below Lake Mary and before the Creek's confluence with Hot Creek. MCWD also maintains nine groundwater production wells in and around the Mammoth Lakes community which contribute to the municipal water supply system. MCWD's annual report on the results of its groundwater monitoring program for October 2011 through September 2012, which more particularly describes MCWD's production and monitoring wells and their locations, is available for your information and review at http://www.mcwd.dst.ca.us/ProjectsReports/SchmidtReports/Schmidt%20GW2012.pdf. MCWD will provide you with a hard copy of this report under separate cover. A10-3

As noted in the Draft EIS/EIR, the Project will include construction of a new 33-megawatt (MW) binary geothermal power plant, up to 16 wells for production and reinjection, and associated pipelines and ancillary facilities. (Draft EIS/EIR, p. 2-3.) The Project is expected to result in increases in the extraction and reinjection of a large volume of geothermal brine from the deep layers of the Mammoth Groundwater Basin. Such increased levels of pumping and reinjection, in various areas of the aquifer, has the potential to cause negative impacts resulting from changes in hydraulic head between upper and lower aquifer layers. This, in turn, could cause changes in the surface water hydrology of Mammoth Creek affecting MCWD's ability to divert its surface water supply due to the state-mandated streamflow requirements. This also could cause changes in water quality and water supply availability to MCWD's production wells, which operate in the upper (approximately 700 feet) layers of the groundwater aquifer. Because these wells form a critical part of the current and long-term water supply for the Mammoth Lakes community, MCWD is deeply concerned about the Project's potential impacts to the region's hydrology and groundwater resources, and in particular to its production wells.

II. MCWD's Overall Comments

(A) *The Draft EIS/EIR Is Inadequate Because It Lacks Critical Information Necessary to Form Proper Conclusions Regarding the Project's Potential Impacts to Groundwater Resources*

The discussion contained in Chapter 4.7 (Environmental Consequences - Geothermal and Groundwater Resources) and Appendix D (Geologic and Geothermal Resources Technical Report) of the Draft EIS/EIR does not provide sufficient details to enable MCWD to consider the Project's potential impacts to groundwater resources. A10-4

For example, the Draft EIS/EIR concludes that the cold groundwater aquifers in the Mammoth Groundwater Basin are separated from the deeper, hotter geothermal system by impermeable geologic units, and that geothermal production from the proposed Project is not expected to adversely affect the water quality of the shallow groundwater system. (Draft EIS/EIR, pp. 3.7-14 to 3.7-18; App. D, pp. D-25 to D-27.) As Mr. Wildermuth and Mr. Wang discuss in their

letter, this conclusion appears to have been utilized as an assumption in developing the geothermal reservoir simulation model used to evaluate the Project's impacts on geothermal and groundwater resources. However, there is insufficient information in both the Draft EIS/EIR and Appendix D to allow MCWD and other public stakeholders to evaluate the validity and scientific appropriateness of that model. (See Wildermuth Letter, p. 2.) Mr. Schmidt also points out in his comment letter that this conclusion is based on very limited data of little value. (See Schmidt Letter, pp. 1-2.)

A10-4 cont'd

In addition, as described in Mr. Schmidt's letter, the Draft EIS/EIR does not include subsurface geologic cross-sections of the Mammoth Groundwater Basin extending both through the western part of the Project's proposed geothermal well field and the MCWD production wells closest to the Project. Such cross-sections are necessary to show the water production zones tapped by MCWD's wells, the cold groundwater at the proposed well field, the geothermal zone to be tapped in the proposed well field, and the geothermal zone closer to MCWD's production wells. (See Schmidt Letter, p. 1.) Although a subsurface cross-section is presented on page 3.7-16 (Affected Environment – Geothermal and Groundwater Resources), it does not clearly show the claimed separation between the groundwater tapped by MCWD's wells and the proposed geothermal well field. (See Draft EIS/EIR, p. 3.7-14.)

A10-5

Mr. Wildermuth and Mr. Wang also discuss in their letter the inadequacy of Appendix D. For example, they state that the conceptual model description of the geothermal reservoir simulation model was a conceptual model <u>in name only</u> and would not pass for a conceptual model description required for the development and application of a numerical model. (See Wildermuth Letter, p. 4.) This is because such description contains no hydrostratigraphic sections and includes only a speculative and incomplete discussion of recharge and discharge components based on previous reports with no quantitative assessment of such components. (*Id.*) The absence of such discussions in Appendix D deprives MCWD of the ability to meaningfully evaluate the soundness of the geothermal reservoir simulation model and the quality of the resulting analysis of the Project's potential impacts in the Draft EIS/EIR.

A10-6

(B) *<u>The Draft EIS/EIR Makes Unreliable Conclusions Regarding the Project's Potential Impacts to Groundwater Resources</u>*

The Draft EIS/EIR states that operation of the proposed Project alternative "is <u>anticipated</u> to have little to no effect on the availability and quality of groundwater resources used for drinking water supply." (Draft EIS/EIR, p. 4.7-10, underlining added.) It also states that "the combined impact of operation and maintenance of the Project . . . is <u>unlikely</u> to cause an adverse cumulative effect with respect to geothermal and groundwater resources." (*Id.*, p. 7.7-16, underlining added.) The Draft EIS/EIR goes on to conclude that, because the groundwater aquifer used for drinking water supplies is physically separate from the underlying hot geothermal reservoir, the production and injection of geothermal fluid would not substantially affect the availability or quality of the groundwater supplies, and that such impact would therefore be less than significant. (*Id.*, p. 7.7-13.) Similarly, "increasing geothermal fluid production in the geothermal reservoir is not anticipated to cause noticeable impacts to springs, surface waters, and other hydrologic surface features . . . . [and] [p]otential impacts would be less than significant." (*Id.*, at p. 7.7-14.)

A10-7

However, as noted in Mr. Wildermuth's and Mr. Wang's letter, the above-referenced analysis does not take into account the numerous active faults and ruptures in the northwest-southeast alignment of the Mammoth Lakes-Casa Diablo-Hot Creek areas, as shown in figure 5 of Appendix D. (App. D, p. D-62.) The possibility that these faults may connect the deep geothermal water

system and shallow cold groundwater system is not sufficiently addressed in either the Draft EIS/EIR or Appendix D. Moreover, given the lack of scientific data provided in Appendix D, it is unclear how such potential connection affects the application of the simulation model used to analyze the Project's impacts on groundwater resources.

In his comment letter, Mr. Schmidt states:

> "There is a significant lack of data on the nature of the geologic materials below the bottoms of wells in the District well field. Thus there appear to be only three data points to indicate the supposed separation between the cold groundwater and the geothermal water in the Mammoth Lakes area. Such few data points do not support a widespread separation. Part of the logic used in the [Draft EIS/EIR] is that there was no impact on cold water due to the historical geothermal project, so thus there will be none due to the proposed project. However, a major difference is that in the Casa Diablo area, geothermal water is moving upward toward the cold water. In contrast, in and near the District well field, a downward flow of cold groundwater to the geothermal water is indicated. One concern of the District is that some of the cold water now available to District wells, other wells, and to springs may be diminished. The [Draft EIS/EIR] indicates that there was cold groundwater inflow induced by pumpage of geothermal water for the historical project. Accordingly, the very limited data and information in the [Draft EIS/EIR] do not support the conclusion that there is a widespread separation between the cold water and the geothermal water in the vicinity of the District supply wells."
>
> (Schmidt Letter, p. 2.)

A10-7 cont'd

The Draft EIS/EIR concludes that the operation and maintenance of the Project will not result in a significant impact on groundwater resources. However, as explained above, there is insufficient empirical or experimental data and explanatory information to support such a conclusion. The lack of such data suggests either that adequate information has not yet been developed to render definite significance determinations regarding the Project's impacts, or that even with such data, there is insufficient supporting evidence to conclude with certainty that the shallow cold groundwater system is separated from the deep geothermal water system. In either case, the Draft EIS/EIR affords MCWD no basis for analyzing the evidence used to support such a conclusion. Requiring MCWD to simply rely on the conclusions or opinions stated in the Draft EIS/EIR without assessing the adequacy of the methods and information used to arrive at such conclusions or opinions contravenes the spirit of public comment and review process included in CEQA and the National Environmental Policy Act (NEPA).

A10-8

III. MCWD's Specific Comments

In addition to the overall comments expressed above, MCWD provides the following specific comments for your consideration:

Comment No.	Page(s)	COMMENTS
1	ES-1	The Background and Project Overview should indicate which entity, if any, will be utilizing the power to be generated by the proposed Project for its state-mandated renewable portfolio standard (RPS) targets. This information is important in light of the

A10-9

Comment No.	Page(s)	COMMENTS	
		quantification of Project benefits under the greenhouse gas (GHG) reduction tonnage and relates to the receiving entity's existing generation portfolio GHG emissions averages.	A10-9 cont'd
2	ES-1, 2	Numerous references in the Draft EIS/EIR are made to the Project being decommissioned in 30 years. The Draft EIS/EIR should provide specific assurances (for example, by briefly describing lease terms) supporting such an assertion. MCWD has observed that the trend for the Casa Diablo complex and other geothermal production projects has been towards extended service life through redeveloping wells, replacing power generation units, etc. If the Project reasonably is expected to operate beyond 30 years, then such operation is a potentially significant consideration for areas of potential impacts. Such areas range from wildlife and vegetation to regional groundwater impacts, including the sustainable (as opposed to relatively transient) benefits of any claimed GHG emission offsets. The Draft EIS/EIR should cite to adequate legal and regulatory bases for the assumption of such decommissioning. In addition, the impacts analysis (including cumulative impacts analysis) should be updated to reflect comparisons based on the 30-year presumed Project life versus an effectively perpetual Project life, assuming future facility replacements and upgrades.	A10-10
3	ES-3, 5	The Draft EIS/EIR states that the proposed Project will have a parasitic load of 22 percent, with proportional reductions in GHG emissions relative to the quantity and use of the geothermal resource to meet the net production target of 33 MW. This value seems highly uncertain given that it depends on numerous factors, including the pumping depths of the production wells and injection pressures for reinjection wells. Other sections of the Draft EIS/EIR note the need for up to 16 new wells, each for either of these uses. It is unclear how the parasitic load, a key factor of overall system efficiency, can be determined when the well sites have ground elevation differences of up to 300 feet. Such differences may impact the net pumping lift or injection pressures, and related parasitic power loads and net power generation.	A10-11
4	ES-4	The need for up to 18 well locations to generate the same power currently being generated with just two production wells and two injection wells (approximately 30 MW) must be clarified. The fact that the Project needs to develop and test so many well sites in order to achieve the targeted power production levels indicates a high degree of uncertainty, contrary to the high level of certainty in below ground conditions implied in numerous areas of the Draft EIS/EIR.	A10-12
5	ES-4	The range of Project alternatives is neither reasonable nor adequate. When the proposed Project alternative is reviewed in the context of the entire existing Casa Diablo power generation complex, at least one alternative should consider upgrades to existing facilities (for example, the pending MP-1 plant replacement project, which would increase net power generation without any proportional use of geothermal resources). The Draft EIS/EIR's failure to consider the entire power plant complex, including those not owned by ORNI 50 LLC or Ormat Nevada Inc., treats what essentiality is a single geothermal power production system as separate units. Such "piece-mealing" is prohibited under NEPA and CEQA. Existing and future geothermal plants feed into the same grid, use the same geothermal resources, and must be managed in a coordinated fashion to prevent conflicting operations within the common geothermal reservoir system. Such factors support the need to analyze any proposed improvements, including the construction, operation and maintenance of additional geothermal plants, production and injection wells and ancillary facilities, as a single project and not a series of individual projects. Moreover, the cumulative impacts of such projects should be explored and sufficiently	A10-13

Comment No.	Page(s)	COMMENTS	
		analyzed. One other potential alternative should consider how the proposed well sites and pipelines could be phased and developed to achieve the target 33-MW production. Constructing the fewest number of wells (i.e., closest to the number of wells currently operated by the Casa Diablo power generation complex) should be a common objective shared by the Project alternatives described in the Draft EIS/EIR, as this minimizes the Project's potential impacts and risks to various resources, including the region's groundwater systems. This type of phasing approach is neither described nor required by any of the Project alternatives, but is essential to accomplish CEQA's objective of presenting alternatives capable of substantially lessening or avoiding the Project's significant effects.	A10-13 cont'd
6	ES-8	The Project's stated benefit of displacing over 89,000 metric tons of CO_2e per year for the 30-year life of the Project is not substantiated with any specific existing power generation portfolio mix being substituted by the Project. The Draft EIS/EIR should list the assumptions behind the projected CO_2e offsets. The Project's GHG and hydrologic analyses do not include any consideration of projected climate change impacts to regional hydrology and the stated recharge sources for the geothermal reservoir. The State of California's and other model projections show significant impacts to the Sierra's hydrology within the Project area's watersheds, both within the Mammoth Creek basin and the Dry Creek Basin (the stated primary source of recharge to the geothermal reservoir). The Draft EIS/EIR should consider the potential changes to the assumed recharge area watershed hydrology in the next 20 to 50 years, as such changes directly impact the modeled and projected long-term conditions of the geothermal reservoir and any linked hydrologic systems.	A10-14
7	1-1, 2 2-44	The Draft EIS/EIR states that the Project will be "decommissioned." It therefore should describe and assess the activities involved in such decommissioning. For example, would it include the demolition, removal or restoration of pipeline areas, the demolition and removal of power generation stations, and the abandonment of wells? Although section 2.2.8 (Project Decommissioning) of the Draft EIS/EIR implies that such activities will be required, it is ambiguous. If some or none of these activities are implicated, then the Draft EIS/EIR should clearly describe what is meant by "decommissioning" the Project.	A10-15
8	1-4	The description of existing geothermal facilities indicates that the Project is being evaluated in a "piece-meal" fashion, which is prohibited under NEPA and CEQA, rather than at a proper level that reflects the practical factors linking several projects that are individually evaluated and permitted. These factors include the geographic proximity of power generation stations with common features, common use of the existing pipelines for conveying extraction and injection flows, a common geothermal reservoir source used by all of the power generation plants, and a common private utility grid system into which such geothermal power is being fed.	A10-16
9	2-2	The Draft EIS/EIR does not provide a reasonable range of alternatives because it does not include either a power production level-based alternative or, as previously described in Comment No. 5, an alternative involving geographically-based phasing and development. Moreover, the Draft EIS/EIR does not provide a clear basis for the 33-MW power production target. For example, it does not explain whether this target is the minimally commercially viable project, or the estimated maximum that can be sustained by the geothermal resource based on current knowledge. The Draft EIS/EIR also does not address the question of what the forecasted	A10-17

Comment No.	Page(s)	COMMENTS	
		capacity of the common geothermal resource area is. The Project's allowance of up to 16 new wells indicates that if the potential power production of the Project exceeds the 33-MW target, no consideration is given to the incentives of expanding current facilities as well as building expanded new facilities. Under federal land use policy, renewable energy development and its associated benefits are highly valued. Therefore, it would be appropriate for the Draft EIS/EIR to consider a larger system (for example, a 60-MW system) capable of providing those benefits.	A10-17 cont'd
10	2-4	Project Alternative 1 describes the Project's gross and net power generation and sources of parasitic loads (such as well pumps). However, given that the number and location of the proposed wells have not yet been finalized, the basis of such parasitic load calculations and resulting statements regarding gross and net power generation are unclear. In addition, the need for a third pipeline could be avoided if the existing pipeline, which is used to convey extracted water to the power plants from existing well sites, were replaced with a single larger pipe that can handle total anticipated future flows. If such an alternative is considered, the final pipeline corridor would be narrower than a three-pipeline corridor and accordingly would have fewer impacts to surface features. The option of replacing an existing pipe should be evaluated as part of Project Alternative 3, which focuses on "modified pipeline alternatives" and appears to include only very minor changes to some localized pipe segments of specific wells. The approach of "six new wells per year" of the Draft EIS/EIR, which starts from the western-most end of the Project area, seems likely to ensure maximum Project impacts to surface areas. To minimize such impacts, a phased development of wells from the southeast to the northwest boundaries of the Project area should be considered and analyzed.	A10-18
11	2-8	The description of the Project's construction and phasing in section 2.2.2 of the Draft EIS/EIR is inadequate and ambiguous. The phasing of the power plant, pipelines and wells are all linked and should be described in greater detail. Moreover, a discussion as to whether all 10 available well sites would be developed through full pump testing before any is taken to the production phase should be included. A description of how the phased construction of the pipelines ties to the phased construction of the wells also should be included.	A10-19
12	2-15	Additional information regarding the need for 18 well sites and up to 16 final production wells should be provided, especially in light of the fact that the existing power plants already produce approximately 30 MW with only two production wells. The need for up to 18 well sites indicates a high degree of uncertainty regarding the below ground conditions and behavior/features of the geothermal reservoir, which conflicts with the high degree of certainty implied in conclusions contained in the Draft EIS/EIR regarding impacts to upper aquifer areas used for community water supply.	A10-20
13	2-22	Section 2.2.4.5 of the Draft EIS/EIR does not clearly describe when a well would be developed further; i.e., from testing conditions to permanent production conditions. The phasing of these activities, relative to the 18 well sites, is fundamental to the resulting potential long-term surface impacts and relative risks to linked hydrologic systems, as noted earlier. Section 2.2.4.5 also should include specific requirements for coordinated monitoring during all phases of well development and testing to verify any impacts to shallow groundwater systems and the community water supply.	A10-21

Comment No.	Page(s)	COMMENTS	
14	2-28	The description of the pipeline and construction description contained in section 2.2.5 of the Draft EIS/EIR is inadequate in terms of the level of certainty provided concerning the geographic extent and sizing of the pipelines and public safety considerations with a high pressure, high temperature fluid system located in open public land. The pipelines' total length, stated at 5.7 miles for the injection line and 9.2 miles total, is dependent on the number and location of the 18 available well sites. The Draft EIS/EIR does not explain why the pipes need to be constructed at the stated lengths; there is no basis provided for the pipelines needing to be this long, with resulting corridor impact areas. Moreover, the Draft EIS/EIR does not substantiate that the pipelines will be built in a manner linked to phased well development in order to minimize the project area needed for the 33-MW power production target. Instead, since a pipeline will, practically speaking, be built only once, it is not clear what the basis is for the sizing of the lines if they are built before it is known exactly how many, and what locations, are needed to support the 33-MW power production target. The Draft EIS/EIR also does not take into account the hazards presented by the pipelines that would convey water from the production wells. These pipelines will be carrying water at extremely high pressure and temperature, and would be located above the ground except in certain road crossing areas. Access to these pipelines appears to be unrestricted, especially since they are located in areas of high recreational use. In the event of a pipeline failure, acts of vandalism or other unanticipated events, any potential harm to any person near the pipeline break would be significant. The Draft EIS/EIR should include mitigation measures to reduce these risks.	A10-22
15	2-45	The Project design measures described in section 2.2.9 of the Draft EIS/EIR are inadequate. At minimum, these measures should include a series of dedicated monitoring wells located between the geothermal operations and the community's groundwater aquifer to ensure that there will be no significant impacts to the community water supply as the Project is developed. The monitoring data must be provided to MCWD. The Project also should include requirements for a more carefully defined phased construction of the wells and the pipelines to minimize the Project's environmental footprint.	A10-23
16	2-52	The mitigation measures described in section 2.2.10 of the Draft EIS/EIR are inadequate. At minimum, these mitigation measures should include specific phasing requirements and long-term monitoring wells to ensure that the Project will not have any significant impacts to groundwater resources. MCWD must have access to such monitoring data.	A10-24
17	2-58	The proposed mitigation measure to address climate change impacts (GHG-1) is inadequate. The Draft EIS/EIR does not consider any documented climate change impacts to the geothermal reservoir over the course of the Project's life. The State of California's climate modeling indicates a reduction in snowpack water content of up to 49% by mid-century in areas supplying the Dry Creek and Mammoth Mountain watershed, which are noted as sources of recharge for the geothermal reservoir. The Draft EIS/EIR should evaluate how these changes in recharge hydrology may impact geothermal resources, the coldwater aquifers and the Project's sustainability under potentially lower recharge.	A10-25
18	2-65	The Draft EIS/EIR's water resources analysis and associated mitigation measures are inadequate. As described elsewhere in this comment letter, there is no adequate basis for the no-impact determination regarding the Project's impacts to groundwater resources. Additional physical exploration via new wells is required to evaluate potential	A10-26

Comment No.	Page(s)	COMMENTS	
		significant impacts to the community's water supply.	A10-26 cont'd
19	2-75	The description of the No Action Alternative does not provide a sufficient basis for comparing its impacts with the impacts of approving the proposed Project because the contemplated actions under the No Action Alternative seem unreasonable and unrealistic at best. For example, with respect to figure 2-15, why would additional test wells need to be completed, at a substantial cost to the Project applicant, when the Project applicant has not identified a use for these wells? The No Action Alternative's impacts analysis should be revised to assume that no further actions will be taken at these well sites.	A10-27
20	3.7-3	The extent of the low permeability landslide block, which is referenced throughout the Draft EIS/EIR as a key assumption regarding the hydrogeologic connectivity between the upper and lower aquifer levels, is only shown in figures 3.7-2 and 3.7-3 along a North-South cross-section cut. No detailed cross-section in an east-west direction showing the extent of this same layer, which direction includes the area extending to MCWD's groundwater wells, is provided. Given repeated observations in the Draft EIS/EIR that the geology and hydrology of the area are highly complex, fractured, and relatively dynamic due to local volcanic and faulting features, the conclusions concerning the lack of interconnection among the aquifer areas of concern are suspect and not supported by the very limited information in the Draft EIS/EIR.	A10-28
21	3.7-12	The discussion concerning the thermal and geothermal hydrology of the Long Valley Caldera does not address the vertical flow of upper, cooler water into the lower geothermal reservoir. Although the isotope tracing and chemical traits may be appropriate for primary source water identification, it is not apparent that they are a basis for supporting a conclusion that there is no vertical connectivity in the Mammoth Groundwater Basin between these levels. Moreover, the discussion notes that pressure variations are seen in shallow wells up to six miles from Casa Diablo under current operations, tied to geothermal production area. Such variations demonstrate the Project's risk of causing increased pressure changes and impacts to the aquifer if pumping and injection operations were expanded.	A10-29
22	3-7.14	The claimed separation of the upper and lower aquifers is not substantiated for the areas of concern to MCWD. The conclusions concerning vertical separation between the upper and lower levels appear to rely on well bore data from locations that are too distant to be reasonably used as the basis for analyzing local conditions, especially in an aquifer system characterized by extreme relative variability both vertically and horizontally. Moreover, statements concerning the stable chemistry are indicative only of existing steady conditions, and such observations should not be used as a basis to evaluate future conditions, which include increased pumping and reinjection operations.	A10-30
23	3.7-19	Section 3.7.2.2 of the Draft EIS/EIR describes that the LVHAC would evaluate expansion of the hydrologic monitoring program in Long Valley, which would be incorporated as a condition of approval for the Project. This is not an appropriate response to addressing the potential environmental impacts to the District's operations. It is noncommittal and does not contain any important elements of a monitoring program. A monitoring program needs to be objective, state its purpose and deliverables, have a funding mechanism, and ~~state~~ include action triggers if unanticipated environmental effects occur.	A10-31
24	4.7-1	The methodology for analyzing the environmental consequences of the Project do not address the specific items of concern listed by MCWD in its scoping letter dated May 10, 2011. These include, for example, the lack of efforts to merge or coordinate the	A10-32

Comment No.	Page(s)	COMMENTS	
		geothermal reservoir model with the upper aquifer model developed by MCWD. Moreover, the Project's design measures for monitoring are inadequate, as they rely only on the existing Long Valley Hydrologic Advisory Committee, which focuses primarily on areas around and to the east of Casa Diablo, and does not include sufficient monitoring, if any, for the areas of concern to the upper aquifer and the MCWD drinking water supplies.	A10-32 cont'd
25	4.7-3	The operations description of the proposed Project does not make sense in terms of changes in pumping levels. Doubling the power production to 60-MW or greater is described to result in only a 50% increase in pumping. What factors are behind this seemingly low future pumping increase, compared to current pumping rates at the 30-MW production level? Higher temperature in groundwater, for example, or more efficient power plant facilities? If only 6,000 gpm of net additional pumping is expected, what are 18 well sites required to develop and test? The discussion states that historic monitoring indicates an influx of cooler water into the geothermal reservoir in the 1980s. This statement seemingly contradicts assertions throughout the Draft EIS/EIR that the upper and lower aquifers are not connected, and the Draft EIS/EIR fails to adequately reconcile such observed influxes with conclusions regarding the separation between the upper and lower aquifers.	A10-33
26	4.7-4	The numerical model described in section 4.7.4.1 of the Draft EIS/EIR does not have sufficient borehole-based data to accurately capture the areas of concern near and between the Project's proposed geothermal operations and MCWD's municipal water supply operations.	A10-34
27	4.7-9	The discussion concerning the use of additional monitoring wells does not provide sufficient information or commitments to allow for adequate monitoring in the future to detect and mitigate for any impacts to upper aquifer conditions. Before any final EIS/EIR is completed, there needs to be the additional drilling of exploratory wells in order to confirm assumptions concerning the lack of vertical connectivity.	A10-35

IV. The Lead Agencies' Refusal to Disclose Information Fundamental to the Evaluation of the Project's Environmental Impacts Has Precluded Meaningful Review of the Draft EIS/EIR

NEPA requires that lead agencies insure the professional integrity, including scientific integrity, of the discussions and analyses in the Draft EIS/EIR. (See 40 C.F.R. § 1502.24) Courts have applied this requirement to hold that an environmental impact statement must contain an adequate compilation of the relevant data and information, and must present accurate and complete information to decision makers to allow informed decisions. (See, e.g., *Northern Plains Resource Council, Inc. v. Surface Trans. Bd.* (9th Cir. 2011) 668 F.3d 1067, 1085; *Sierra Club v. U.S. Army Corps of Engineers* (2d Cir. 1983) 701 F.2d 1011, 1029.) CEQA contains similar requirements for environmental impact reports. Section 15147 of the CEQA Guidelines requires that an EIR include technical data and similar relevant information to permit the full assessment of significant environmental impacts by reviewing agencies and members of the public. (Code Cal. Regs., tit. 14, § 15147; see *San Franciscans for Reasonable Growth v. City and County of San Francisco* (1987) 193 Cal.App.3d 1544, 1549 (noting EIR must include underlying technical detail so readers can evaluate its conclusions).) An EIR should be prepared with a sufficient degree of analysis to provide decision makers with information that enables them to make a decision which intelligently takes account of environmental consequences. (Code Cal. Regs., tit. 14, § 15151.) "The EIR must contain facts and

A10-36

analysis, not just the bare conclusions of a public agency. An agency's opinion concerning matters within its expertise is of obvious value, but the public and decision-makers, for whom the EIR is prepared, should also have before them the basis for that opinion so as to enable them to make an independent, reasoned judgment." (*Santiago Water District v. County of Orange* (1981) 118 Cal.App.3d 818, 831.)

Recognizing and relying upon these important principles, MCWD sent the lead agencies a letter dated January 11, 2013 requesting additional technical data concerning the Project to adequately evaluate the conclusions contained in the Draft EIS/EIR. Such data was relied upon extensively in the Draft EIS/EIR's discussion and analysis of the Project's potential impacts to geothermal and groundwater resources, and includes, among other things, the following information:

- Complete borehole logs for the geothermal wells and any test holes, and any associated information depths and perforated intervals of wells, subsurface geologic conditions and water levels;
- By geothermal production well: time histories of geothermal production, temperature, and reservoir pressure;
- By geothermal injection well: time histories of geothermal injection, temperature, and reservoir pressure;
- A conceptual model description of the geothermal reservoirs in the Long Valley area that are being used for existing and proposed geothermal development;
- Numerical model reports that document the models, input and output files, model assumptions, calibration, and planning simulations used in the Draft EIS/EIR;
- The cross-sections used to define the cold water and geothermal reservoir systems and to build the geothermal reservoir simulation model (including maps showing the locations of these cross-sections);
- The water budget time histories for the final calibration and projection simulations for the geothermal reservoir simulation model, including the location map that shows the location of recharge and discharges from the model; and
- Time series of pressure head maps for the geothermal reservoir for the final calibration and projection scenarios utilized in the model.

A10-36 cont'd

In addition, MCWD requested that BLM provide the reference cited as "Sorey 2011b" in pages 4.7-1 and 4.7-11 of the Draft EIS/EIR. As of this writing, neither BLM nor the Project applicant has provided the requested information to MCWD. Moreover, both BLM and the Project applicant have asserted that most of the requested information, including the requested reference cited in the Draft EIS/EIR, is proprietary and is protected from disclosure.

A10-37

MCWD has repeatedly stated that its ability to review the requested information is essential to evaluate the Draft EIS/EIR's significance determinations for the Project. NEPA clearly requires that the "hard data" on which agencies base their conclusions be provided in the environmental document. (*Idaho Sporting Congress v. Thomas* (9th Cir. 1998) 137 F.3d 1146, 1150 (reversed on other grounds by Lands Council v. McNair (2008) 537 F.3d 981, 997), underlining added.) Moreover, under CEQA, an EIR cannot rely on information that is neither included in the document nor described or referenced therein. (*Vineyard Area Citizens for Responsible Growth v. City of*

A10-38

Rancho Cordova (2007) 40 Cal.4th 412, 442, underlining added.) As previously explained in MCWD's communications with BLM and GBUAPCD, such information is essential to MCWD's review of the Draft EIS/EIR, as relevant discussions in the Draft EIS/EIR do not provide an adequate basis for MCWD to meaningfully consider the Project's impacts on geothermal, groundwater and surface water resources. Moreover, if such information is not provided as part of the administrative record under CEQA, then there simply can be no sufficient evidence to support the significance determinations in the Draft EIS/EIR.

A10-38 cont'd

The lack of transparency exhibited by the lead agencies and the Project applicant in declining to share the requested data essentially precludes meaningful public review and understanding of the Project's potential impacts and contravenes the spirit of NEPA and CEQA. In light of this, MCWD respectfully renews its request to review the information set forth in the bullet points above, and reiterates its willingness to cooperate with the lead agencies and the Project applicant to ensure that such information is not used for purposes other than NEPA's and CEQA's public review and comment process.

A10-39

V. Conclusion

In summary, MCWD finds that the Draft EIS/EIR is legally deficient under NEPA and CEQA because it fails to provide critical information necessary to form proper conclusions regarding the Project's potential impacts. This determination may be supplemented or supplanted pending MCWD's review of the additional information described in Part IV above.

A10-40

Sincerely,

Gregory Norby
General Manager
Mammoth Community Water District

Encls: Comment Letter from Kenneth D. Schmidt
Resume of Kenneth D. Schmidt
Comment Letter from Mark Wildermuth and Wenbin Wang
Resume of Mark Wildermuth
Resume of Wenbin Wang

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January 30, 2013

Mr. Greg Norby, General Manager
Mammoth Community Water District
P.O. Box 597
1315 Meridian Blvd.
Mammoth Lakes, CA 93546

Re: Casa Diablo IV Geothermal
Project Draft EIR/EIS

Dear Greg:

I have a B.S. in geology from Fresno State College (1964) and a M.S. and PhD in hydrology from the University of Arizona (1969 and 1971). I have over 46 years of work experience in hydrogeology and have been a Registered Geologist in California since 1970 and a Certified Hydrogeologist since 1995. A copy of my professional experience is attached. Following are my comments on the Draft EIR/EIS for the Casa Diablo IV Geothermal project. I have been involved with groundwater studies in the Mammoth Lakes area since 1987. Our firm has been involved with development of all of the new District water supply wells since that time. In addition, we have prepared 20 annual reports on the results of the District groundwater monitoring program. I have previously reviewed information on the past geothermal well drilling at Mammoth Lakes and other information relevant to the historical geothermal activities.

A10-41

Overall Comments

The discussion of the possible impact of this project on groundwater tapped by District wells is based largely on generalities, as opposed to more detailed information that should be provided. For example, no subsurface geologic cross sections that extend both through the western part of the proposed geothermal well field and the nearest District water supply wells were provided. At least two such cross sections are needed to clearly indicate in the vertical and horizontal sense the water production zone tapped by District wells, the cold groundwater at the proposed well field, the geothermal zone to be tapped in the proposed well field, and the geothermal zone closer to the District supply wells (based on test holes in Mammoth Lakes). Water levels and water temperatures for the cold groundwater,

A10-42

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shallow low temperature thermal water, and geothermal groundwater should also be shown on the sections. Water-level elevation maps showing the lateral direction of cold groundwater flow and geothermal water for the area, including the proposed geothermal well field and the District supply wells, should also be provided. Lastly, all of the evidence indicating that the groundwater tapped by District wells is separate from geothermal groundwater to be tapped by the proposed geothermal well field should be clearly presented (i.e. permeability tests, aquifer tests, etc.). A10-42 cont'd

Although a subsurface cross section was presented in the document on Page 3.7-16, it was not clearly shown where any "separation" is located. I have been involved in almost all of the District supply wells that were constructed after 1986. These wells were generally not bottomed in non-water producing deposits. Rather, a drilling method (the casing hammer) was used that enabled collection of water samples during drilling. The ultimate depth of each well was based largely on my previous review of the depths where higher temperature water was present in the vicinity and the water temperatures encountered during drilling of the new District wells. That is, the ultimate depths were selected to stay above higher temperature groundwater, and to hopefully preclude production of higher temperature groundwater when pumping. A10-43

There is a significant lack of data on the nature of geologic materials below the bottoms of wells in the District well field. Thus there appear to be only three data points to indicate the sup-posed separation between the cold groundwater and the geothermal water in the Mammoth Lakes area. Such few data points do not support a widespread separation. Part of the logic used in the DEIR/EIS is that there was no impact on cold water due to the historical geothermal project, so thus there will be none due to the proposed project. However, a major difference is that in the Casa Diablo area, geothermal water is moving upward toward the cold water. In contrast, in and near the District well field, a downward flow of cold groundwater to the geothermal water is indicated. One concern of the District is that some of the cold water now available to District wells, other wells, and to springs may be diminished. The Draft EIR/EIS indicates that there was cold groundwater inflow induced by pumpage of geothermal water for the historical project. Accordingly, the very limited data and information in the DEIR/EIS do not support the conclusion that there is a widespread separation between the cold water and the geothermal water in the vicinity of the District supply wells. A10-44

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Lastly, in order to protect the District groundwater supply if the project is approved, two actions are essential. First, is that the District be involved in the review process for the proposed annular seals for the new geothermal production and injections wells. It is stated in the document that the "cold water" will be sealed off in these wells, but the proposed process does not involve the District. My experience with the DOG & GR in the San Joaquin Valley is that water well users interests are not always fully considered in such a process. Second, it was stated that the Long Valley hydrologic monitoring program "may" be revised for this project. If the new geothermal project is approved, a revision of this program is absolutely necessary, and District approval of the revised plan is mandatory. For example, monitoring points between the new geothermal well field and the District wells, and for the cold groundwater in and near the proposed geothermal well field are needed. A10-45

In summary, it is my opinion that because of the considerable lack of data and information in the DEIR/EIS, as indicated in my comments, it is impossible to render an opinion on whether or not the proposed project would have significant adverse effects on the District wells or the cold groundwater.

Specific Comments

Table of Contents Page 8. Why is groundwater resources under 4.7 separate from water resources (4.19)? A10-46

Figure 2-1 It is necessary to also have one map that includes District water supply wells and the proposed geothermal wells. A10-47

Page 2-17 For the existing geothermal wells in the Mammoth Lakes area and in or near the proposed geothermal well field, geologic logs, temperature logs, and well construction diagrams, specifically showing the extents of the annular seals in these wells should be provided. A10-48

Page 2-25 The exact criteria to be used to determine the depth of the cemented surface casing should be provided. Will this be based on water production, temperatures, a confining layer, or what? Specifically how will the "base of the lowest groundwater aquifer" be determined? In the Draft EIR/EIS, the word "groundwater" is vague. That is, the term "groundwater aquifer" can apply to both the cold groundwater and the geothermal water. There is also higher temperature non-geothermal groundwater. This vague terminology should be replaced with specifically what is meant (i.e. cold water or geothermal water). A10-49

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Page 3.7-3 The 'landslide block' is indicated to "isolate the warm shallow (groundwater) outflow at the Casa Diablo production area from deeper or lateral cold natural recharge from the caldera margin…" The vertical extent of the "landslide block" should be shown. Regarding the comment "elsewhere within the caldera, cold recharging water from the caldera rim penetrates the deeper fractured Bishop Tuff…", the location of this needs to be clearly shown on a map. The locations of District supply wells should be shown on Figure 3.7-2. A10-50

Page 3.7-6 "This shallow geothermal zone is separated from the shallower cold groundwater aquifer… to the west in Basalt Canyon by altered sections of the upper Early Rhyolite". The geographic extent of where this separation is indicated to be present should be clearly shown on a map, along with District water supply wells. In addition, the vertical extent of the separation should be shown on at least two subsurface geologic cross sections. A10-51

Page 3.7-9 The impacts of past geothermal operations at Casa Diablo on cold groundwater at and near Casa Diablo should be discussed in detail, including observed drawdowns. A10-52

Page 3.7-11 "The conceptual model of the geothermal system" should be portrayed in three dimensions, including for the cold groundwater tapped by District wells, to the northeast, and in the proposed geothermal well field. A detailed water-level map for the area north of that presented in Figure 18 of Appendix D should be provided. A10-53

Last paragraph. The "drilling results" should be explained in detail. Since none of the District wells encountered this "thick section of Early Rhyolite", the data points are limited to three geothermal wells (OH 1, MLGRAP 1, and MLGRAP 2). Attached is a map showing locations of District supply wells and these geothermal wells. A subsurface cross section should be developed from MLGRAP 1 on the north, through District wells No. 17, 20, and 16, and then through OH 1. Another should be developed through RD08, District TH-8, MLGRAP 2, and District Wells No. 19 and 14. A10-54

Any hydraulic evidence of this separation (hydraulic heads, permeability tests, aquifer tests, etc.) should be provided. A10-55

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Page 3.7-12 "To date, sampling of shallow groundwater has shown no chemical evidence of mixing with geothermal water…". Noticeable decreases in groundwater pH have been periodically observed in water from some District wells, and the reason has not been clearly determined. The explanation given for the elevated groundwater temperatures in District Wells No. 15-20 is not conclusive, as indicted by the statement: "The elevated temperatures could be…". Thus an expanded evaluation of the temperatures of water in District wells should be presented. A10-56

Page 3.7-14 Regarding "changes in the chemistry of groundwater wells in the Mammoth Groundwater Basin from 1996 to 2009…". This statement is not true in terms of pH for some District wells, as has been pointed out in a number of our annual reports on the District groundwater monitoring program. A10-57

Last paragraph. The Sorey (2011b) reference was not included under the references for Water Resources (Section 3.19). While this discussion focuses on the possible influence of the geothermal water pumpage on cold water well temperatures and chemistry, an important issue is exactly where the cold water moves downward and into the geothermal reservoir. Also, the geothermal water to be tapped is indicated to be under pressure (confined), and pumping from confined aquifers can cause relatively large drawdowns at considerable distances from the pumped wells. The lowered hydraulic head in the geothermal zone could induce more downward flow of the cold groundwater, which needs to be addressed. A10-58

Figure 5 The cross section was not discussed in any detail in the document, although such a discussion is needed. The extent of the "separation" should be clearly shown. No District wells that I am aware of bottomed in the "Separation" zone. A10-59

Page 3.7-18 "Furthermore, throughout much of the drilled sections in the caldera, the geothermal zones are separated from cold groundwater aquifers…" A map needs to be provided clearly showing the location of "much of the drilled section". "…the physical separation begins to disappear and the systems intertwine". The location of where this begins should be clearly shown on a map. Also, only three data points are available in the Mammoth Lakes area. These holes cover such a small area, that they are not necessarily representative of the larger area at and near the District well field. Lastly, the focus is backwards in terms of impacts to cold water tapped by District A10-60

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wells. The real issue is the extent of downward flow of cold water to the geothermal water, primarily in and near the District well field. The DEIR/EIS does not address this. A10-60 cont'd

"Shallow low temperature thermal water zones at approximately 450 feet below the surface above the Early Rhyolite". This water seems potentially close to the cold water tapped by District wells. Is this low temperature thermal water to be sealed off in the new geothermal wells? A10-61

Page 3.7-19 "...the LVHAC would evaluate expansion of the hydrologic monitoring program...". This expansion should be mandatory and approved by the District. A10-62

Page 3.19-5 The locations of the District supply wells should be clearly shown on a map that also shows the proposed geothermal wells. The comment that the "groundwater basin has not been extensively characterized" is not applicable to all of the basin. The use of the word groundwater is vague; that is, cold water, low temperature thermal water, and geothermal water can all be called groundwater. MCWD has extensively characterized the cold groundwater in the area west of SC-1 and SC-2. Included are test hole drilling, geologic logs, discreet zone water sampling, aquifer tests, and interpretation of extensive groundwater monitoring data in 20 annual reports. The referenced comment makes one wonder how much of this information was obtained and used in preparation of the Draft EIR/EIS. In fact, water level trends for only two MCWD wells were discussed. I found no reference to any annual MCWD monitoring report in the documents. A10-63

Page 3.19-6 Some groundwater in the basin has pH values below recommended levels for human consumption and treatment for high manganese concentrations is necessary for water from most of the District wells. A10-64

Page 4.7-3 Cold water influx was mentioned on Page 4.7-3. Stabilization after the early phase does not necessarily mean that the cold water influx did not continue. The discussion that is most relevant to MCWD concerns is the influence on the cold water (i.e. water levels). All of the cold water monitoring that was done should be clearly discussed. A10-65

Page 4.7-4 Cold water monitoring results associated with "Basalt Canyon Production" should be discussed in detail. The A10-66

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comment that "the pressure response of the shallow aquifer at this location is affected by both groundwater and Casa Diablo production" is confusing. It appears that little or no monitoring of the cold water has been done for the geothermal production in Basalt Canyon. A10-66 cont'd

Page 4.7-5 The reason for the temperature decline that is projected needs to be clearly discussed, including cold water influx. A10-67

Page 4-7.9 Decommissioning. Next to last sentence. The word "expected" was used twice in one sentence. The problem is that impacts on cold water for the historical geothermal project were not discussed in any detail. "The use of casing would seal the upper groundwater…". Casing alone does not produce the seal and an adequate annular seal is also necessary. The well permit should be reviewed by the District. The term "upper groundwater" is vague; for example does this include only cold water, thermal water, or what? What criteria will be used for the depth of sealing? A10-68

Page 4.7-10 Geologic Setting. There are apparently only three holes in the western caldera. Three holes over such a large area simply cannot demonstrate "a generally impermeable barrier". Such a conclusion must also be based on hydraulic information (i.e. hydraulic heads, aquifer test results, etc.). "The observed monitoring does not indicate a connection of the shallow groundwater with the underlying deep geothermal reservoir". The monitoring is not nearly comprehensive enough to support this conclusion at all locations. In some places, such as the caldera margin, the cold groundwater is supposed to be moving downward to recharge the geothermal reservoir. Thus, the connection is present somewhere, but the extent has not been clearly shown on a map. A10-69

Page 4.7-11 Geochemistry. The Sorey (2011b) reference was not provided under the Water Resources references. "Suggesting that there is a pressure separation between the systems" indicates that it is not really known whether a separation exists and indicates a need to develop more information to ascertain the facts. The statement that "It is likely to affect only the temperatures" implies that increasing temperatures of water from District wells are of no concern, which is not true. A10-70

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Last sentence "...do not appear to be the result of" again indicates the need to develop more information to ascertain what is actually occurring. A10-70 cont'd

Page 4.7-12 Summary. The "available evidence" needs to all be provided, including a) more subsurface cross sections, and b) any hydraulic tests (i.e. permeability). The current groundwater quality is not within acceptable drinking water standards in terms of manganese and pH. A10-71

Appendix D

Page D-25 "These cold groundwater aquifers are separated from the deeper hotter geothermal system by either intense alteration of thick ash-rich Early Rhyolite units in the western caldera...". How many data points are there in the vicinity of the District well field? Only three gradient holes were mentioned at or near Mammoth Lakes. It would be useful to have a large-scale map showing the District supply wells and any geothermal test holes within about one mile of these. Geologic and temperature logs for these and subsurface geologic cross sections through District wells and these holes are essential before any conclusions on separation can be drawn. A10-72

Page D-26 There are dozens of other "monitored shallow non-thermal groundwater wells in the Mammoth Groundwater Basin" than the three cited. Only one of these (M-14) is near the District well field, and this is not necessarily representative. A10-73

Page D-27 Project impacts. There appears to be no discussion of water-level changes for the cold groundwater due to the historical geothermal project. A10-74

Page D-33 "Suggest that the cooling trend in produced fluids... is predominantly related to the intrusion of small amounts of cold meteoric water or cold groundwater in the shallow geothermal reservoir...". The term "small amounts" needs to be quantified. This statement implies that pumpage of geothermal fluid induced some cold water to move into the geothermal reservoir. Could a similar movement happen for the proposed project and how many acre-feet per year would be involved? A10-75

Page D-41 Early development monitoring. What has monitoring of the cold groundwater levels indicated? A10-76

KENNETH D. SCHMIDT AND ASSOCIATES
GROUNDWATER QUALITY CONSULTANTS

Figure 11 The locations of District supply wells and the proposed geothermal wells should be clearly shown on one map. A10-77

Figure 12 Two maps are shown, but no explanation was provided for the lower one. The lower one should be shown alone on an 8-1/2x11 inch or larger page, so that the numbers can be read more clearly. A10-78

Figure 16 Why was the record for MW-14 stopped? Continued measurements are available to the present for this well. A10-79

Figure 17 On the lower graph, CW-3 should apparently be SC-2. A10-80

Figure 18 SC-1 is not a District well, as the title indicates. This map appears to be a revision of one of the District's annual water-level maps, but no time period for the water-level elevations shown is shown. A10-81

Figure 24 Each of the figures should be enlarged and shown on at least an 8-1/2x11 inch paper. The well descriptions and explanations are too small to read. A10-82

Figure 25 Lithologic logs and temperature gradients for the gradient holes at Mammoth Lakes and to the northeast are essential to provide more information on the relation between the cold groundwater and the geothermal water. A10-83

Sincerely yours,

Kenneth D. Schmidt

Kenneth D. Schmidt

KDS/cl

R 27 E
Geothermal Wells
MLGRAP1
MLGRAP2
Mammoth Creek at Old Mammoth Road
No. 26
No. 24
No. 7
No. 29
No. 30
No. 28
No. 19
No. 21
No. 2 (Abandoned)
14M
SNOW CREEK GOLF COURSE
No. 27
No. 3 (Abandoned)
4M
No. 6
No. 17
No. 25
No. 15
No. 22
10M
No. 20
No. 16
No. 1
No. 23
12M
No. 10
No. 18
5M
No. 11
11M
No. 5A
T. 3 S.
T. 4 S.
A

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KENNETH D. SCHMIDT AND ASSOCIATES
GROUNDWATER QUALITY CONSULTANTS

PROFESSIONAL EXPERIENCE
KENNETH D. SCHMIDT
JUNE 2012

BIRTHPLACE AND DATE

Madera, California on November 8, 1942

DEGREES

B.S. Geology, Fresno State College, Fresno, California (1964)
M.S. Hydrology, University of Arizona, Tucson, Arizona (1969)
Ph.D. Hydrology, University of Arizona, Tucson, Arizona (1971)

REGISTRATION AND CERTIFICATION

Geologist No. 1578 in California (1970)
Geologist No. 23685 in Arizona (1989)
Geologist No. G462 in Oregon (1978)
Hydrogeologist No. 176 in California (1995)

SOCIETY MEMBERSHIP

A10-85

American Water Resources Association (1972)
American Water Works Association (1970) (Life Member)
California Groundwater Resources Association (1996)
Geological Society of America (2006)
Water Pollution Control Federation (1972)

PROFESSIONAL EXPERIENCE

July 1972 to Present: Principal, Kenneth D. Schmidt and Associates, Groundwater Quality Consultants, Fresno, California.

January 1969 to June 1972: Hydrologist, Harshbarger & Associates, Consultants in Hydrogeology, Tucson, Arizona.

December 1964 to February 1967: Engineering Geologist, Bookman-Edmonston Engineering, Inc., Arvin, California.

As an engineering geologist with Bookman-Edmonston Engineering, Inc. in Arvin from 1964-67, Schmidt's primary duties included hydrogeologic studies associated with the development and operation of two large-scale recharge and groundwater recovery facilities southeast of Bakersfield, California. This experience included the basic aspects of groundwater studies, including preparing a well inventory, water-level measurements, aquifer testing, logging drill cuttings, interpreting geophysical logs, observing well drilling and construction, collecting water samples for chemi-

cal analyses from hundreds of water supply wells, and data interpretation. He conducted specific studies of land surface subsidence due to groundwater overdrafting and of the occurrence of high boron contents in groundwater northeast of Arvin. Schmidt subsequently completed a Master's thesis (in the hydrology program at the University of Arizona) in 1969 on the boron problem in the Arvin area.

As a hydrologist with Harshbarger & Associates in Tucson from 1969-72, an investigation was conducted on groundwater conditions and potential groundwater development for the City of Fresno. Schmidt's interest in the presence of high nitrate contents in groundwater of the Fresno urban area resulted in the subsequent completion of a Ph.D. dissertation in 1971 (also at the University of Arizona) on that topic. Since that time, he has participated in four master plan updates for the Fresno Metro area and prepared a comprehensive nitrate evaluation for the City of Fresno in 2006.

A10-85 cont'd

As the principal of his own consulting firm (Kenneth D. Schmidt & Associates) since 1972, Schmidt has conducted and supervised over a thousand hydrogeologic investigations in the southwest, primarily in Central California. In the early 1970's, he participated in development of the Tulare Lake Basin (south part of the San Joaquin Valley) Water Quality Plan. As part of this project, he developed salt budgets for sub-basins, and evaluated the distribution of chemical constituents such as nitrate and boron in groundwater, and the impacts of irrigation and waste disposal facilities on groundwater quality. In the mid-1970's, Schmidt worked on development of some of the first national guidelines for groundwater quality monitoring with General Electric TEMPO in Santa Barbara.

By the late 1970's, Schmidt began to design, develop, and implement some of the earliest groundwater quality monitoring programs at specific sites in California. His involvement with some of these has continued through to the present. Although a full-time consultant, he has conducted more than a dozen University of California extension classes and other short courses since the late 1970's on groundwater hydraulics, groundwater quality and contamination, and monitoring. Since 1973, he has periodically taught hydrogeology classes at California State University, Fresno. In 1997, Schmidt received the Best Paper Award for the Ground Water journal for his article "Water Quality Variations for Pumping Wells".

In 1980, Schmidt began working on a number of projects to develop new public-supply wells in water quality problem areas.

Included have been hundreds of such wells in high salinity, nitrate, sulfate, arsenic, fluoride, iron, manganese, hydrogen sulfide, color, DBCP, EDB, and uranium areas of the San Joaquin Valley. His work in this regard for dozens of cities, water utilities, and schools has continued through to the present.

From 1985 to 1988, he was a member of the National Academy of Sciences Committee on Irrigation-Induced Water Quality Problems. The committee work focused on agricultural drainage problems, including the San Joaquin Valley. For a number of years following the inception of the U.S. Geological Survey National Water Quality Assessment Program in the mid-1980's, Schmidt was a member of a national advisory committee for that program. In 1987, he was named the Chairman of the Groundwater Sub-Committee of the Technical Advisory Committee for the San Joaquin Valley Agricultural Drainage Program. From 1992-98, Schmidt was a member of the Industrial Advisory Council in the College of Engineering at the University of Arizona. From 1993-2003 he was a member of the Department Advisory Committee that evaluated the hydrology program at the University of Arizona. In April 1995, Schmidt received the Distinguished Citizens Award from the University of Arizona, Alumni Association for outstanding contributions to the university.

A10-85 cont'd

Since the mid-1990's, KDSA has been a leader in groundwater resource and quality evaluations in Central California. The firm has been involved with a number recharge and water banking projects, including: the Arvin-Edison Water Storage District in Kern County, the Semitropic Water Banking Project in the Shafter-Wasco area, the Kern Fan Water Banking Projects west of Bakersfield, the Apex Ranch project southwest of Kingsburg, the Fresno Irrigation District Water Bank, the James Irrigation District project near San Joaquin, and the Madera irrigation District Madera Ranch project. KDSA has worked on numerous other groundwater recharge evaluations, including selection and evaluation of areas favorable for recharge, exploration, and monitoring of existing facilities. KDSA has completed detailed groundwater evaluations for development of Water Management Plans in the Cities of Bakersfield, Clovis, Fresno, Madera, Livingston, Tulare, and Dinuba. KDSA has prepared in numerous groundwater sustainability evaluations. Ken Schmidt has also provided expert witness services for numerous litigation cases involving groundwater in the San Joaquin Valley. KDSA has conducted detailed groundwater studies associated with EIRs for numerous gravel mines and rocks quarries in Fresno, Madera, Merced, and Tulare Counties. During the past two decades, KDSA has designed and implemented enhanced groundwater monitoring programs at dozens of sites, including municipal WWTF, food processing sites, and dairies. The firm specializes in

interpretation of monitoring results. During the past two decades, the firm has worked on hundreds of new deep irrigation wells in the west and south part of the valley. During 2007-12, the firm worked on arsenic mitigation programs for the Cities of Hanford and Delano and for the Arvin CSD.

SELECTED CLIENTELE

Cities and Towns

Atwater, Public Works Department
Bakersfield, Wastewater Division
Clovis, Public Works Department
Corcoran, Public Works Department
Delano, Water Division and Wastewater Division
Dinuba, Public Works Department
East Orosi
Exeter, Water Division and Wastewater Division
Firebaugh
Fresno, Public Works Department, Water Division, and Wastewater Division
Galt
Gustine
Hanford, Public Works Department
Kerman, Public Works Department
Los Banos
Lindsay, Public Works Department
Madera, Public Works Department
Mammoth CWD (Mammoth Lakes)
McFarland
Mendota, Public Works Department
Modesto, Public Works Department
Newman
Patterson
Porterville
Reedley, Public Works Department
Sanger, Public Works Department
San Joaquin, Water Department
Santa Clara, Department of Public Works
Stevinson Ranch
Sultana
Tulare, Public Works Department
Turlock, Public Works Department
Wasco, Wastewater Division
Woodlake

A10-85 cont'd

5

Counties

County of Fresno, Departments of Public Works, Planning, and Environmental Health
County of Madera, Department of Public Works
County of Merced
County of Sierra
County of Tulare, Department of Public Works

Engineering Firms

AECOM, Fresno and Bakersfield
Alan Mok Engineering, Clovis
Blair, Church, and Flynn, Clovis
Carollo Engineers, Fresno and Sacramento
Dee Jaspar and Associates, Bakersfield
GEI (Bookman-Edmonston Engineering), Bakersfield
Provost & Pritchard Engineering Group, Fresno, Visalia, and Bakersfield
Quad Knopf, Fresno, Visalia, and Bakersfield
Yamabe and Horn Engineering, Fresno

A10-85
cont'd

Farming Entities

ACDF, Inc., Kern County
Britz Farms, Five Points
Coleman Farming, Fresno and Madera Counties
Dalena Farms, Avenal
Gary Esajian Farms, Lemoore
Farmland Management Services, Kern County and Madera County
Five Points Ranch, Five Points
Grimmway Farms, Kern County
Harris Ranch, Coalinga
John Seasholtz Farms
Kaweah-St. Johns Farmers League
Maricopa Orchards, Kern County
O'Neill Farming Enterprises, Five Points
Paramount Farms, Madera, Kern, and Tulare Counties
Primex World
Red Rock Ranch, Five Points
Gary Robinson, Western Fresno County
RTS Agribusiness, Kern County
Setton Pistachios, Terra Bella
Starrh Farms, Shafter
Sun Pacific, Cawelo
Sun World, Bakersfield
Ted Sheely Farms, Lemoore
Triangle T Ranch, El Nido

James Walker Farms, Fresno
Westside Harvesting, LLC, Huron
Woolf Farms, Huron

Industries

California Portland Cement Co., Mojave and Colton
Central Valley Meat, Hanford
CIBA GEIGY, Sanger
Dole Fruit & Nut Co., Fresno
Food Machinery Corporation, San Jose
Gallo Winery, Fresno and Livingston
The Garlic Company, Lerdo
Guardian Glass Plant, Kingsburg
GWF Power Systems, Inc., Hanford and Kingsburg
Holly Sugar Co., Tracy and Imperial
Kraft Foods, Tulare
Kenetech Alternative Power Systems, Kingsburg
Pacific Ethanol, Madera
Rogers Helicopters, Inc., Clovis
Sperry New Holland, Fowler
Spreckels Sugar Company, Manteca, Mendota, Salinas, and Woodland
Sunkist, Tipton
Sun-Maid Growers of California, Kingsburg and Orange Cove
Thermo-Electron Energy Systems, Mendota
Ultra Power, Inc., Kern County
Valley Perforating Co., Bakersfield

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Irrigation Entities

Angiola Water District, Corcoran
Arvin-Edison WSD, Arvin
Central California Irrigation District, Los Banos
Columbia Canal Company, Firebaugh
Eastside Water District, Stanislaus County
Firebaugh Canal Water Co. Firebaugh
Friant Water Users
James Irrigation District, San Joaquin
Madera Irrigation District
North Kern Water Storage District, Cawelo
Panoche Drainage District
San Joaquin River Exchange Contractors Authority, Los Banos
Semitropic Water Storage District, Wasco

Mining Companies

Artesia Ready Mix, Lemoncove
Calavaras Materials, Fresno and Merced Counties
Granite Construction, Fresno and Madera Counties

LeHigh Hanson, LLC-CMI, Kings River and Merced Co.
Madera Quarry Hildreth Creek
Madera Sand & Rock, Madera
Sonora Mining Corporation, Jamestown
Stewart & Nuss, Fresno
Vulcan Materials, Centerville, Fresno, Los Banos, and Madera County

Private Water Companies

Bakman Water Co., Fresno
Cal Water Service, Selma and Bakersfield
East Niles CSD, Bakersfield
North of the River MWD, Bakersfield
Oildale Mutual Water Co., Bakersfield
Vaughn Water Co., Bakersfield
West Kern Water District, Taft

A10-85 cont'd

Special Districts

Kern County Water Agency, Bakersfield
Monterey County Flood Control and Water Conservation District, Salinas
Monterey Peninsula Water Management District, Monterey
Selma-Kingsburg-Fowler County Sanitation District, Kingsburg
Sierra Valley Groundwater Management District, Loyalton

Publications and Articles

"The Use of Chemical Hydrographs in Groundwater Quality Studies", in Hydrology and Water Resources in Arizona and the Southwest, vol. 1, Arizona Section AWRA, pp 211-223, 1971.

"Nitrate in Groundwater of the Fresno-Clovis Metropolitan Area, California", Ground Water, vol, 10, No. 1, pp 50-64, 1972.

"Groundwater Contamination in the Cortaro Area, Pima County, Arizona", in Hydrology and Water Resources in Arizona and the Southwest, vol. 2, Arizona Section AWRA, pp 95-111, 1972.

"Groundwater Quality in the Cortaro Area Northwest of Tucson, Arizona", Water Resources Bulletin, vol. 9, No. 3, pp 598-606, 1973.

"Nitrates and Groundwater Management in the Fresno Urban Area", Journal AWWA, vol. 66, No. 3, pp 146-148, 1974.

"Regional Sewering and Groundwater Quality in the Southern San Joaquin Valley", Water Resources Bulletin, vol. 11, No. 3, pp 514-525, 1975.

"Salt Balance in Groundwater of the Tulare Lake Basin, California", in Hydrology and Water Resources in Arizona and the Southwest, vol. 5, Arizona Section AWRA, pp 177-184, 1975.

"Monitoring Groundwater Pollution", Proceedings of the International Conference on Environmental Sensing and Assessment, Groundwater Section, sponsored by EPA, WHO, and University of Nevada, Las Vegas, Nevada, September 1975, The Institute of Electrical and Electronics Engineers, Inc., vol. 1, session 9, No. 4, pp 1-6, 1976.

"Academic Training for Groundwater Quality Specialists", in Hydrology and Water Resources in Arizona and the Southwest, vol. 6, Arizona Section AWRA, pp 119-123, 1976.

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"Monitoring Groundwater Quality: Methods and Costs", U.S. Environmental Protection Agency, Environmental Monitoring Series, Report EPA-600/4-76-023, with L.G. Everett, 1976.

"Monitoring Groundwater Quality: Monitoring Methodology", U.S. Environmental Protection Agency, Environmental Monitoring Series, Report EPA 600/4-76-026, with D.K. Todd, R.M. Tinlin, and L.G. Everett, 1976.

"Monitoring Groundwater Quality: Illustrative Examples", U.S. Environmental Protection Agency, Environmental Monitoring Series, Report EPA 600/4-76-036, with R.M. Tinlin, 1976.

"A Groundwater Quality Monitoring Methodology", Journal AWWA, vol. 68, No. 11, pp 586-593, with D.K. Todd, R.M. Tinlin, and L.G. Everett, 1976.

"Water Quality Variations for Pumping Wells", Ground Water, vol. 15, No. 2, pp 130-137, 1977.

"Protection of Groundwater from Nonpoint Sources of Pollution", Proceedings of Symposium on Drinking Water Quality Enhancement through Source Protection, American Chemical Society, Division of Environmental Chemistry, New Orleans, Louisiana, March 20-25, 1977, Ann Arbor Science Publishers, Inc., pp 257-273, 1977.

"Impact of Land Treatment of Wastewater on Groundwater", Proceedings of National Conference on Environmental Engineering, Kansas City, Missouri, July 10-12, 1978, University of Missouri-

Columbia, pp 118-125, 1978.

"Proceedings of Symposium on Establishment of Water Quality Monitoring Programs", Edited by L. G. Everett and K. D. Schmidt, American Water Resources Association, San Francisco, California, June 12, 14, 1978, 370p, 1979.

"The 208 Planning Approach to Groundwater Protection - What is Wrong and What Can be Done About It?", Ground Water, vol. 17, No. 2, pp 148-153, 1979.

"Monitoring Perched Ground Water in the Vadose Zone", in Proceedings of the Symposium on Establishment of Water Quality Monitoring Programs, American Water Resources Association, Minneapolis, Minnesota, pp 134-149, with L.G. Wilson, 1979.

"Groundwater Quality Impact Determined from Well Sampling", Arizona Department of Water Resources, Report No. 1, Proceedings of Deep Percolation Symposium, Scottsdale, Arizona, April 24-25, 1980, pp 74-84.

"Brine Pollution at Fresno - Twenty Six Years Later", Ground Water, vol. 19, No. 1, pp 12-19, with J.A. Krancher and G. Bisel, 1981.

"Hydrogeology of the Sierra Nevada Foothill Lineament Near Oakhurst, California", Ground Water, vol. 19, No. 2, pp 149 -155 with S. Mack, 1981.

"Persistence of Brine Pollution in Fresno, California Aquifer", Journal Environmental Health, vol. 43, No. 6, pp 314-318, with J.A. Krancher, C.R. Auernheimer, and G. Bisel, 1981.

"Monitoring Groundwater Quality at State Permitted Sites in California", Proceedings of the Thirteenth Biennial Conference on Groundwater, Irvine, California, September 14-15, 1981, California Water Resources Center Report No. 53, pp 87-91, 1981.

"How Representative are Water Samples Collected from Wells?" Proceedings of the Second National Symposium on Aquifer Restoration and Groundwater Monitoring, Columbus, Ohio, May 1982, Water Well Journal Publishing Company, Worthington, Ohio, pp 117-128.

"The Occurrence of Trace Organic Chemical Constituents in Groundwater of the Salt River Valley", Proceedings of the Deep Percolation Symposium, Scottsdale, Arizona, October 1982, Arizona Department of Water Resources Report No. 4, pp 48-58.

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KENNETH D. SCHMIDT AND ASSOCIATES
GROUNDWATER QUALITY CONSULTANTS

"Limitations in Implementing Aquifer Reclamation Schemes", Proceedings of the Third National Symposium on Aquifer Restoration and Ground Water Monitoring, Columbus, Ohio, May 1983, Water Well Journal Publishing Company, Worthington, Ohio, pp 105-110.

"Groundwater Quality Studies in California", Proceedings of the ASCE Irrigation and Drainage Division Specialty Conference, Jackson, Wyoming July 1983, American Society of Civil Engineers, pp 183-191.

"Management of Groundwater Quality Beneath Irrigated Arid Lands", Proceedings of the Western Regional Conference on Groundwater Management, San Diego, California, October 1983, Water Well Journal Publishing Company, Worthington, Ohio, pp 77-84.

"Developing Groundwater Quality Monitoring Networks in California", Proceedings of the 15th Biennial Groundwater Conference, San Diego, September 23-25, 1985, University of California, Davis, pp 47-51.

"Proceedings of Symposium on Groundwater Contamination and Reclamation", Edited by K.D. Schmidt, American Water Resources Association, Tucson, Arizona, August 14-15, 1985.

"Are Humid Area Monitoring Concepts Applicable to Arid Lands?", Proceedings of Sixth National Symposium and Exposition on Aquifer Restoration and Groundwater Monitoring, May 19-22, 1986, Columbus, Ohio, pp 41-49.

"Hydrologic Aspects of Subsurface Drainage", Proceedings of the 1986 Regional Meetings, U.S. Committee on Irrigation and Drainage, July 30-August 1, 1986, Fresno, Calif., pp 55-64.

"Monitoring Groundwater Quality in the Southwest", American Society of Civil Engineers, Proceedings of Water Forum '86, World Issues in Evolution, August 4-6, 1986, Long Beach, Calif., 6 p.

"DBCP in Groundwater of the Fresno-Dinuba Area, California", National Water Well Association, Proceedings of the Agricultural Impacts on Groundwater Conference, August 11-13, 1986, Omaha, Nebraska, pp 511-529.

"Monitor Well Drilling and Sampling in Alluvial Basins in Arid-Lands", National Water Well Association, Proceedings of the FOCUS Conference on Southwestern Groundwater Issues, October 20-22, 1986, Tempe, Arizona, pp 443-455.

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"Effect of Irrigation on Groundwater Quality in the Southwest", Proceedings of the 1986 Regional Meetings, U.S. Committee on Irrigation and Drainage, October 22-24, 1986, Mesa, Arizona, pp 273-290.

"Effect of Irrigation on Groundwater Quality in California", with I. Sherman, Journal of Irrigation and Drainage Engineering, ASCE, Vol 113, No. 1, 1987, pp 16-29.

"Development of Public-Supply Wells in the Salt River Valley", in Proceedings of the Arizona Hydrological Society 1st Annual Symposium, Phoenix, Arizona, September 1988, pp 131-151.

"Contaminant Hydrology Associated with River Recharge of Sewage Effluent", with D.M. Esposito and D.G. Eaker, in Proceedings of Fourth Symposium on Artificial Recharge of Groundwater in Arizona, Tempe, Arizona, May 23-23, 1989, pp 1-20.

A10-85 cont'd

"Developing Integrated Management Strategies for Groundwater Production, Recharge, and Protection in the Salt River Valley", in Proceedings of the Arizona Hydrological Society 2nd Annual Symposium, Casa Grande, Arizona, September 1989.

"Problems with Groundwater Remediation Projects in the Southwest", Proceedings of the Arizona Hydrologic Society 4th Annual Symposium, Casa Grande, Arizona, September 12-13, 1991, pp 3-9.

"Hydrologic Factors Affecting Mobility of Trace Inorganic Constituents", Journal of Irrigation and Drainage Engineering, ASCE, vol. 119, No. 3, 1993, pp 600-612.

"Results of Twelve Years of Groundwater Monitoring at the SKF-CSD Facility in Central California", with D. Michel, Proceedings of the Symposium on Effluent Use Management, American Water Resources Association, Tucson, Arizona, August 29-September 2, 1993, pp 203-212.

"Monitoring Perched Water in Arid Lands", in Handbook of Vadose Zone Characterization and Monitoring, edited by L.G. Wilson, L.G. Everett, and S.J. Cullen, Lewis Publishers, 1995 pp 639-655.

"Groundwater Monitoring Associated with Water Transfer and Banking Projects", Proceedings of the Symposium on Conjunctive Use of Water Resources: Aquifer Storage and Recovery, American Water Resources Association, Long Beach, California, October 19-23, 1997.

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"Enhanced Understanding of Aquifer Confinement in the San Joaquin Valley", in Groundwater and Shared Responsibility, Lorman Educational Services, Fresno, California, January 21, 2009, pp 41-66.

"Developing New Public Supply Wells in the San Joaquin Valley", in Groundwater and Shared Responsibility, Lorman Educational Services, Fresno, California, January 21, 2009, pp 83-123.

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A10-85 cont'd

WILDERMUTH™
ENVIRONMENTAL INC.

January 30, 2013

Mammoth Community Water District
Greg Norby, General Manager
PO Box 597
Mammoth Lakes, CA 93546

Subject: ***Review of the Casa Diablo IV Geothermal Development Project, Public Draft Joint Environmental Impact Statement and Environmental Impact Report, Dated November 16, 2012 (DOI Control No.: DES 12-21, Publication Index No: BLM/CA-ES-2013-002+1793, State Clearinghouse No.: 2011041008)***

Dear Mr. Norby:

Pursuant to your direction and Task Order No. 3, Wildermuth Environmental Inc. (WEI) reviewed the subject environmental document (ED). WEI reviewed these documents to assess the adequacy of their evaluation of the proposed project's potential impacts to the MCWD's water supply wells and to the cold groundwater system tapped by these wells, as well as to the surface hydrology which could affect the MCWD's ability to meet certain streamflow requirements.

The proposed project (Project) includes:

1. The construction and operation of 16 new geothermal wells, of which 14 will be located in Basalt Canyon. These new geothermal production wells will be drilled between 1,600 and 2,000 feet below ground surface (ft-bgs) and the associated injection wells will be drilled below 2,500 ft-bgs.
2. The injection wells will be located and operated to re-pressurize the geothermal reservoir and to dispose of the geothermal fluid. This balancing act will be figured out after the wells are constructed and from subsequent modeling.
3. An increase in geothermal production from the current production rate of about 12,000 to 18,000 gpm.
4. The Project proponent proposes construction techniques to ensure that cold groundwater aquifers used for water supply will not be impacted, and that the BLM inspectors will be notified prior to constructing the actual well.

The ED discussion in the sections entitled "Surface Water and Shallow Groundwater" on pages 3.7-10 and 3.7-11 and "Geologic and Geothermal Resources Technical Report," on pages D-25 through D-27 (Appendix D), concludes that the cold groundwater aquifers in the Mammoth Groundwater Basin are separated from the deeper hotter geothermal system

A10-86

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by impermeable units of intensely altered Early Rhyolite units in the west caldera and a landslide block in the south central caldera, and that geothermal production from the proposed Project is not expected to adversely affect the water quality of the shallow cold groundwater system. These conclusions are implied or directly stated in other places in both documents.

The ED discussion in the section entitled "Groundwater Resources" on pages 4.7-9 through 4.7-13 concludes, based on existing studies and more specifically historical data, that there is a negligible contribution of geothermal water in the shallower cold groundwater system that is currently used by the MCWD. And, it further concludes that the geology and source water locations are such that the proposed new geothermal production in Basalt Canyon will not impact the shallower cold groundwater system that is currently used by the MCWD.

A10-86 cont'd

In general, we agree that most of the existing monitoring data from historical Casa Diablo project operations generally support these conclusions for the existing Casa Diablo project (Note: the Casa Diablo project is about four miles east of the MCWD well field and that the new geothermal production wells will be located two to three miles east of the MCWD's wells field). However, there are numerous NW-SE trending active faults and ruptures in the in the Mammoth Lakes-Casa Diablo-Hot Creek areas (as shown in Appendix D, Figure 5, page D-62). These faults may connect the deep geothermal water system and shallow cold groundwater system. Geothermal water discharges as hot springs in the Fish Hatchery and Hot Creek are related to these faults.

A10-87

The relatively high Cl/B ratio of 22.4 in groundwater sampled at well MCWD 17, which is located in the western portion of the Mammoth Groundwater Basin, indicates that geothermal water has intruded into the shallow cold groundwater system tapped by this well and is clear evidence that under historical pre-Project conditions that the cold water and geothermal systems are connected in this area. Furthermore, MCWD wells 16, 17, 18, and 20 are about 10°C warmer than other the MCWD wells. These facts mean that the geothermal and shallow cold water aquifers are connected in some way in the western part of the Mammoth Basin. While mentioned in the ED, these facts have been ignored in the formulation and application of a model used to assess the impacts of the proposed Project.

Based on our review of the ED and discussions with the Project proponent staff on January 28, 2013, the consultants working on the ED created a geothermal reservoir simulation model (GRSM) to develop and evaluate the Project. The GRSM has not been provided for our review based on a claim of proprietary information. The GRSM contains information which is the foundational basis for the impacts analyses in the ED. Additionally, the ED concludes that there will be no impact to the shallower cold water aquifers and that the MCWD will be able to produce groundwater from the cold water aquifers and divert surface water after the Project is implemented. Without the ability to review the GRSM, it is not possible to verify the appropriateness of such analyses. There is no information in the ED or the Technical Report that can be used to evaluate the scientific appropriateness of the GRSM, the assumptions made in the application of the GRSM to the Mammoth area, and the subsequent calibration and application of the GRSM to evaluate the Project impacts on

A10-88

the ability of the MCWD to continue to produce groundwater from the cold water aquifers and divert surface water after the Project is implemented. As you may recall we sent the MCWD a letter on January 10, 2013[1] requesting certain information. We were told by the lead agencies that some of the information is confidential and we would not be able to review it. The information specifically requested included:

1. Complete borehole logs for the geothermal wells. If completely available, we could compare this information to the borehole logs of the MCWD and other wells to validate, or not, the hydrogeology conclusions of the Project Proponent.
2. By geothermal production well: time histories of geothermal production, temperature, and reservoir pressure.
3. By geothermal injection well: time histories of geothermal injection, temperature, and reservoir pressure. If the information in item 2 (above) and item 3 (herein) were completely available it could be coupled with historical climatic data and we could compare it to groundwater level data throughout the Mammoth Basin to determine if pressure changes in the geothermal system have historically affected groundwater levels in the cold water aquifers and surface water discharge, and vice versa.
4. Conceptual model description of the geothermal reservoirs in the Long Valley area that are being used for existing and proposed geothermal development.
5. Numerical model reports that document the model(s), input and output files, model assumptions, calibration, and planning simulations.

A10-88 cont'd

Based on discussion with the consultants working on the ED, it appears that the GRSM was assumed to be hydraulically isolated from the shallower cold groundwater system and therefore guaranteeing the GRSM model would not project impacts on the shallow cold groundwater system and the surface water resources in the Mammoth area. The ED contains information at selected geothermal wells and springs, previously published reports and personal conversations from which they make the assumption of hydraulic isolation. The ED contains few useful illustrations and no tables of information from which a professional could draw a similar conclusion or gain confidence in the conclusions offered by the ED. For example, Section 3.7, Geothermal and Groundwater Resources:

A10-89

- Does not contain a readable map that shows the geographic location of the geothermal wells and resources relative to the MCWD production wells;
- Contains one coarse structural cross section across the Mammoth Basin east of the MCWD wells without indication of piezometric levels in the geothermal or shallow cold water aquifer;
- Includes a hydrostratigraphic section from a MCWD report without tying it in to geothermal system.

[1] The MCWD incorporated this request into their information request that was sent to the BLM on January 11, 2013.

Likewise, the Technical Report in Appendix D:

- Contains no cross sections of any kind;
- Several maps that are either illegible or at scales that are not useful to evaluate the impacts of geothermal production on the shallow cold water aquifer system (e.g., Figures 1, 5, 12, 20, 23, 24).
- One partially completed table with surface water quality data.

In the BLM response to the information request contained in the MCWD's January 11, 2013 letter, we were told that some of the information in items 1, 2, and 3 were in the public domain (the remainder being confidential) and could be obtained from the California Department of Conservation (CDOC) website[2]. Item 4 was in the ED and item 5 was confidential. We reviewed the items that were available from the CDOC website and concluded that some of that information was available in a very raw form that would take some time to download and organize for review – a time consuming process that could not be completed in the time remaining to prepare comments for the MCWD on the ED. After processing this data, the information request would only partially be satisfied. Even if we obtained all of the data, it would be impossible to determine how this information was used to construct and apply the GSRM, as no information was provided regarding the model.

A10-89 cont'd

The development of a conceptual model is a fundamental step in the construction of a numerical model and includes the development of hydrostratigraphic cross sections (based on borehole logs, geologic maps, geophysical data, piezometric time series, chemical time series data, and other information), the qualitative and quantitative descriptions of the recharge and discharge components and their processes, and the synthesis of this information that is understandable and implementable in a numerical model. The conceptual model description contained in the ED was a conceptual model *in name only* and would not pass for a conceptual model description as required for the development and application of a numerical model. The conceptual model discussion in the Technical Report (Appendix D) contains: no hydrostratigrahic sections; and only contains a speculative and incomplete discussion on the recharge and discharge components based on previous reports with no quantitative assessment of the recharge and discharge components. Therefore, the resulting discussion (synthesis) of the conceptual model is unsupported. It is not possible, given the conceptual model description in the ED to reliably conclude that the GRSM is appropriately formulated, and therefore, that the MCWD can rely on the impact assessment in the ED.

A10-90

Moreover, item 5 above is essential in our review for the adequacy of the environmental impact assessment of the Project. The lack of transparency exhibited by the Project proponent by not sharing the fundamental data and modeling work that was relied upon for key impact conclusions of concern to the MCWD (specifically impacts to cold groundwater system tapped by MCWD wells and to surface water discharge which could affect the MCWD's ability to meet certain streamflow requirements) prevents public review

A10-91

[2] http://www.conservation.ca.gov/Index/Pages/Index.aspx

and understanding of the potential project impacts and is not in the spirit of NEPA and CEQA. A10-91 cont'd

The operation of 14 new geothermal wells in Basalt Canyon is a completely new stress on the system, and the hydraulic response of this new stress is not accounted for in any of the historical data. The proposed new geothermal wells are closer to the MCWD well field. Given the project description, the ED and the lack of information available for review, the MCWD should be concerned that the operation of proposed new geothermal wells in Basalt Canyon could induce downward flow from the cold groundwater system into the geothermal system, eventually reducing the groundwater yield currently used by the MCWD; and, potentially change the surface water discharge at key locations in the Hot Creek system that could affect the ability of the MCWD to divert surface water in the future. A10-92

Respectfully, given the paucity of evidence offered in the ED, we recommend that the MCWD and Ormat enter into a mitigation and monitoring agreement to ensure that expanded geothermal production in Basalt Canyon will not negatively impact the yield of the cold groundwater system and alter the surface water discharge in the Hot Creek system. As a requirement of the mitigation and monitoring agreement, Ormat and the MCWD should jointly develop a monitoring system and a geothermal production startup plan. Ormat would fund and construct the monitoring system and conduct joint monitoring to determine the state of hydraulic isolation in the Basalt Canyon area prior to the production of geothermal fluids and subsequently during production. The startup of new geothermal production should be gradual, and monitoring should be conducted to assess the change in the state of hydraulic isolation. Finally, the mitigation and monitoring agreement should spell out precisely what Ormat would do should the monitoring results indicate geothermal production has impacted the yield of the cold groundwater system. A10-93

We appreciate the opportunity to serve the Mammoth Community Water District on this important and timely project. Please call me or Wenbin Wang if you have any questions or concerns.

Wildermuth Environmental, Inc.

Mark J. Wildermuth, PE
President and Principal Engineer

Wenbin Wang, Ph.D, PG, CHG
Principal Hydrogeologist

Mark J. Wildermuth, PE

President



Assignment

President

Education

M.S., Systems Engineering, University of California, Los Angeles, 1976

B.S., Engineering, University of California, Los Angeles, 1975

Registrations

Professional Civil Engineer, California C32331

Mr. Wildermuth has 36 years of experience in water resources engineering and planning, including surface and groundwater hydrology and hydraulics, water resources planning, surface water and groundwater computer simulation modeling, water rights, surface water and groundwater quality, flood plain management, municipal recycled water discharge impacts in receiving waters, and water supply and flood control facility design. Mr. Wildermuth has extensive expertise in the development of water resource management plans for groundwater basins and watersheds in Southern California, and he has provided expert witness testimony and opinions for litigation support and mediation in several important cases.

Prior to starting his own company, Mr. Wildermuth held responsible positions at major environmental consulting firms, including James M. Montgomery, Consulting Engineers, Inc., where he was a principal engineer from 1987 to 1990; Camp Dresser and McKee, Inc. from 1980 to 1987; and Tetra Tech from 1976 to 1980. In 1990, Mr. Wildermuth started his own company to focus specifically on water resources management studies and the application of state-of-the-art technology to water resources projects. The company was incorporated as Wildermuth Environmental, Inc. .

Mr. Wildermuth received a B.S. in Engineering from the University of California at Los Angeles in 1975 and an M.S. in Engineering Systems from the University of California at Los Angeles in 1976. He is a member of the National Ground Water Association, the American Water Resources Association, and the Groundwater Resources Association of California. Mr. Wildermuth is a registered professional civil engineer in the State of California.

Selected Project Experience

A10-94

Wildermuth Environmental, Inc. – 1990 to Present

San Juan Basin Groundwater Management Plan and Facilities Plan Update, San Juan Basin Authority

Mr. Wildermuth serves as the project manager, facilitator, and lead technical analyst for the update of the San Juan Basin Groundwater Management Plan and Facilities Plan. The original plan was developed in the early 1990s and resulted in the construction of a groundwater desalter and monitoring. Since that time significant development has occurred, and there is increasing pressure to optimize the use of all resources, specifically groundwater. Mr. Wildermuth and his team completed the most comprehensive "state of the basin" assessment ever done for the Basin, evaluated the hydrology of the Basin to estimate sustainable yield, and are currently evaluating alternatives to increase the sustainable yield. This project is ongoing.

Phase I Investigation to Develop the Cucamonga Basin Groundwater Management Plan Cucamonga Valley Water District and San Antonio Water Company

Mr. Wildermuth serves as the project manager, facilitator, and lead technical analyst for the Cucamonga Basin Groundwater Management Plan. The major pumpers in the Basin have developed a series of management principles around the concept of sustainability. Mr. Wildermuth and his team completed the most comprehensive "state of the basin" assessment ever done for the Basin, evaluated the hydrology of the Basin to estimate sustainable yield. Water quality degradation from past agricultural land use and current onsite waste disposal practices limit production. WEI is about to start the second phase of this work, which involves the development of a new high-resolution groundwater model and the development and evaluation of groundwater management concepts to enable expanded production.

2012 Anti-Degradation Investigation for the Beaumont Basin, Cities of Banning and Beaumont, Beaumont Cherry Valley Water District, and the Yucaipa Valley Water District

Mr. Wildermuth was the project manager in an investigation to predict the TDS and nitrogen concentrations in the Beaumont Management Zone that will result from future groundwater management and recycled water management plans. WEI staff developed and applied a "constantly-stirred reactor" model to estimate the TDS and nitrogen in the water supplies of each municipal pumper in the Basin, the TDS and nitrogen added through use, the impact of evapotranspiration, etc., to estimate the TDS and nitrogen concentrations in the groundwater and at recycling plants at the end of each time period. Twelve management alternatives were evaluated. The results are being used by the Regional Board to prepare a Basin Plan amendment and to write new recycling permits for the client agencies. The work was done in a stakeholder process.

2010 Expert Witness, Antelope Valley Adjudication, Phase III Trial, Law Offices of Lagerlof, Senecal, Gosney and Kruse LLP

Mr. Wildermuth provided expert witness testimony in the Phase III trial where the safe yield of the Antelope Valley groundwater basin was decided. Mr. Wildermuth conducted extensive research, developed a methodology to compute natural recharge, and provided testimony regarding this work. Mr. Wildermuth's testimony was a significant part of case presented by the municipal water purveyors and the US Government. The municipal water purveyors and the US Government prevailed in this phase of the trial.

2010 Recharge Master Plan Update, Chino Basin Watermaster

A10-94 cont'd

Mr. Wildermuth served as the project manager, facilitator, and lead technical analyst for the development of the 2010 Recharge Master Plan Update. This investigation was ordered by the Court and had a Court imposed deadline for completion. Mr. Wildermuth designed the investigation and the report, which were approved by stakeholders and submitted to the Court for approval. The Court subsequently approved Mr. Wildermuth's investigation plan and scope. Mr. Wildermuth managed the overall execution of the investigation, which included three other consultants. Mr. Wildermuth lead nine workshops over a 15-month period and completed the final report one month prior to the Court appointed deadline. The product of this work has been highly praised for its completeness, technical sophistication, and the transparent process in which the work was conducted. Draft sections of the report were posted on the project website, which was developed and maintained by WEI. State-of-the-art surface water models were used to estimate stormwater recharge in spreading basins and in localized recharge facilities that will be constructed to comply with the 2010 MS4 permits. The investigation also determined the existing recharge capacity for imported and recycled waters and the future recharge capacity requirements. The report included conclusions and recommendations for future recharge projects and future supplemental water supply sources, including non-Metropolitan imported water supplies. Currently, Watermaster and the stakeholders are preparing to implement the recommendations of the 2010 Recharge Master Plan Update.

2009 Production Optimization and Evaluation of the Peace II Project Description, Chino Basin Watermaster

In 2007, WEI conducted the Peace II Agreement engineering work for the Watermaster. This work considered future groundwater production projections through 2060, the effective period of the Peace Agreement. This work concluded that the projected groundwater production patterns of the stakeholders coupled with

the existing recharge assets available to Watermaster would lead to unacceptable groundwater depressions in the Chino Basin. Part of the reason for these depressions is the uncoordinated siting and pumping of wells by the stakeholders. WEI examined the projected groundwater production patterns and associated recharge plans to determine if changes could be made in the siting of future wells and if production could be redistributed among wells to reduce the magnitude of changes in groundwater levels. WEI investigated the use of different groundwater recharge schemes to balance groundwater production and recharge in the basin. WEI applied state-of-the-art groundwater models (developed by WEI for Watermaster in 2007) iteratively to optimize groundwater production and recharge patterns in the basin. These revised groundwater production and recharge patterns were then incorporated into an analysis of modifications to the Optimum Basin Management Program, which are required to expand the desalter production facilities and to meet other requirements of the OBMP. Under Mr. Wildermuth's direction, WEI staff used a series of groundwater models to estimate future groundwater elevations across the basin, groundwater elevation time histories at every municipal and many private wells, subsidence potential, impacts on riparian vegetation, impacts to stream flow, and the impact on the transport of several contaminant plumes. The resulting work was accepted by Watermaster and the Inland Empire Utilities Agency and was subsequently incorporated into the *2010 Peace II Subsequent Environmental Impact Report.*

Optimum Basin Management Plan (OBMP), Chino Basin Watermaster

Mr. Wildermuth serves as the project manager and lead technical analyst, providing as-needed engineering services to the Chino Basin Watermaster. Activities include the review of water rights applications, storage losses from over-year groundwater storage accounts, and groundwater monitoring; estimating salt offset credits and the replenishment volumes required for proposed groundwater treatment project(s); coordinating with the San Bernardino County Flood Control and Conservation District regarding recharge and with the Metropolitan Water District regarding water rates and seasonal storage service.

A10-94 cont'd

As the project manager, Mr. Wildermuth developed and implemented the scope of work for the Chino Basin OBMP, which was ordered by the San Bernardino Superior Court. Specifically, Mr. Wildermuth developed the process used in developing the OBMP scope of work and authored the engineering and institutional scopes of work. WEI, under the direction of Mr. Wildermuth, completed engineering and scientific investigations and developed the resulting management plan. The engineering scope of work included the problem definition, the development of goals, developing evaluation tools (groundwater and financial models), developing and analyzing management components, the integration of management components, financial analysis, and the development of an implementation plan.

Optimum Basin Management Plan Implementation, Chino Basin Watermaster

Mr. Wildermuth is the project manager for WEI's involvement in the implementation of the OBMP. WEI's efforts include large-scale surface water discharge and water quality (20 stations), groundwater level and water quality_(600 wells), groundwater recharge, InSAR, and extensometer monitoring programs. WEI also provides oversight on well siting and related impact analyses for new desalter wells.

Chino Basin Dry-Year Yield Program, Chino Basin Watermaster

Mr. Wildermuth serves as the project manager for WEI's involvement in the development of the Chino Basin Dry-Year Yield (DYY) Program. WEI assisted the Watermaster and the Inland Empire Utilities Agency in the development of the 100,000 acre-ft DYY program. WEI completed a thorough reassessment of the hydrogeologic conditions of the Chino Basin and assisted other consultants with facility planning, including well siting, water quality evaluations, and specialized

mapping. WEI developed and applied a sophisticated set of surface and ground water models to evaluate the DYY's impacts on groundwater levels, contaminant plume movement, and surface and ground water interaction in the southern part of the basin. Currently, WEI is expanding this analysis to investigate groundwater storage programs of up to 500,000 acre-ft.

Preparation of Problem Statement and Estimate of Recharge, Antelope Valley Groundwater Adjudication Process, Lagerlof and Senecal

Mr. Wildermuth participated with a panel of experts to estimate the natural recharge in the Antelope Valley adjudication area. Mr. Wildermuth's responsibilities were to estimate the change in groundwater storage during the base period and use the change in storage estimates with production estimates and artificial recharge estimates to compute natural recharge. Mr. Wildermuth and WEI staff exhaustively analyzed groundwater level records and well completion reports to develop a comprehensive groundwater storage change model. Mr. Wildermuth's work was reviewed and approved by the panel of experts and included in their report.

Recharge Master Plan, Chino Basin Water Conservation District, Chino Basin Watermaster, and the San Bernardino County Flood Control District

Mr. Wildermuth was the project manager and lead technical analyst for the recharge master plan of the Chino Basin. The objectives of the master plan were to develop a plan of recharge to meet future groundwater replenishment requirements—utilizing storm water, recycled water, and imported water—and to evaluate the change in groundwater recharge caused by the construction of San Sevaine Creek and East Etiwanda Creek flood control improvements. This study utilized a daily runoff model to estimate the magnitude and temporal distribution of storm water recharge.

A10-94 cont'd

Under the master plan, recycled water and imported water are recharged during periods that ensure minimum conflict with storm water recharge. New facilities and modifications to existing facilities were recommended. A second phase of the recharge master plan was completed as part of the Chino Basin OBMP, in which WEI collaborated with the Black and Veatch Corporation. Upon completion, the Chino Basin Watermaster, the Inland Empire Utilities Agency, the Chino Basin Water Conservation District began converting 19 flood retention basins to spreading basins and began building two new recharge facilities. The total cost of the recharge improvements was about $45 million.

Analyses of Recharge and Recharge Facilities, Chino Basin Water Conservation District

Mr. Wildermuth conducted studies to determine the annual average recharge at the Chino Basin Water Conservation District's storm water recharge facilities. Daily flow simulation models were developed and applied for a 41-year period. The results of this study are being used to improve operations and maintenance schedules at existing facilities. Mr. Wildermuth also developed a monitoring program to determine changes in percolation rates and subsequent maintenance practices to restore maximum percolation rates. A key component of the monitoring program was the installation of digital water level sensors with integral data loggers to measure basin water levels every ten minutes. WEI developed the analytical methods and software to convert these observations into estimates of basin inflow, outlet discharge, evaporation losses, and basin recharge.

Salt and Nutrient Management Plan Development, Nitrogen and TDS Task Force(administered by the Santa Ana Watershed Project Authority)

Mr. Wildermuth was the architect and co-project leader for the development of a comprehensive salt and nutrient management plan for the Santa Ana Watershed. Working with stakeholders and another consultant, Mr. Wildermuth designed the stakeholder process and comprehensive work plan for a multiphase multi-year investigation that would result in a complete rewrite of the salt and nutrient management plans in the Santa Ana Watershed Basin Plan. In this investigation, the Basin Plan objectives for TDS and nitrogen were reset—based on the best available data and scientific methods—and new procedures were developed to assess the availability of assimilative capacity. Phase 1 involved the development of procedures for evaluating TDS and nitrogen impacts from recycling projects in the Santa Ana Watershed, a massive data collection and validation effort, watershed characterization, and an initial assessment of TDS and nitrogen loads to surface water and groundwater from municipal recycled water treatment plants and non-point sources.

Phase 2A involved delineating new basin/management zone boundaries, developing groundwater storage estimates for each management unit, estimating TDS and nitrogen statistics at wells, computing volume-weighted TDS and nitrate concentrations for the new basin/management zones, and completing a new wasteload allocation analysis for the Santa Ana River and selected tributaries.

Phase 2B involved the development and implementation of a sophisticated modeling system to evaluate the then current TDS and total inorganic nitrogen (TIN) wasteload allocations for municipal recycled water plants that discharge to the Santa Ana River and its tributaries. A daily stream flow simulation model was used to estimate TDS and TIN concentrations in the Santa Ana River and its tributaries in response to recycled water discharges, storm water runoff, non-tributary discharges, and groundwater interaction.

A10-94
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San Timoteo Watershed Management Program, San Timoteo Watershed Management Authority

Mr. Wildermuth was the project manager and lead technical analyst in the development of a watershed management program for the San Timoteo Watershed. This effort involved designing the investigation; conducting a stakeholder process; a baseline water resource inventory and characterization; establishing the issues, needs, and wants of the stakeholders; articulating the program goals and impediments to those goals; the development of "program elements" for a watershed-scale management program to remove impediments to those goals; and the development of an implementation plan and cost estimates.

The resulting water resources management plan contained a program to expand the water supply from its current level of about 32,000 acre-ft/yr to 99,000 acre-ft/yr.

Beaumont Basin Adjudication, San Timoteo Watershed Management Authority:

Mr. Wildermuth provided engineering and hydrogeologic support services to the Cities of Banning and Beaumont, the Beaumont Cherry Valley Water District, the South Mesa Water Company, the Yucaipa Valley Water District, and other groundwater pumpers in the Beaumont Basin adjudication. Mr. Wildermuth developed the physical solution incorporated into the stipulated agreement in 2004. Since 2004, WEI under, Mr. Wildermuth's direction, has prepared the engineering and annual reports for the Beaumont Basin Watermaster.

Hot Creek Fish Hatchery Spring Flow, Mammoth Community Water District

Mr. Wildermuth was the project manager and lead technical analyst for an investigation of groundwater pumping impacts on Hot Creek Fish Hatchery spring flow. This investigation, which was completed in 1995, showed that existing groundwater production had negligible impacts on spring discharge. Subsequently, WEI reviewed newly obtained data for the 1995 through 2001 period, verifying its 1995 findings and paving the way for increased groundwater production to support new development. This work was revisited in 2003 due to concerns that increased groundwater production might impact springs in the Valentine reserve. Subsequent analyses by WEI demonstrated that no impacts would occur as a result of production.

Groundwater Management Plan, Eastern Municipal Water District

Mr. Wildermuth developed a groundwater management plan for the West San Jacinto Basin, consistent with the long-term water resource management goals of the Eastern Municipal Water District and agricultural water users. The plan was developed under the then recently enacted California groundwater management statute (AB 3030) and was subsquently implemented. This plan received the Edmund G. Brown award from the State of California in 1995.

Menifee Basin Desalter, Eastern Municipal Water District

Mr. Wildermuth conducted investigations to design a 3-mgd well field for the Menifee Basin Desalter.

Groundwater Modeling, Montgomery Watson (for the Santa Ana Watershed Project Authority)

Mr. Wildermuth provided hydrologic and groundwater-modeling services for the design of two 8-mgd well fields and a 12-mgd well field in the Chino Basin. These well fields were intended to feed the desalting facilities owned by the Santa Ana Watershed Project Authority. Mr. Wildermuth assisted the Chino Basin Watermaster in the development of replenishment sources for the Chino desalting facilities and in the determination of salt extraction credits for agricultural interests in the basin.

A10-94 cont'd

Groundwater Contamination Superfund Site, Confidential Client

WEI conducted a study to determine the potential source(s) of a groundwater plume that contains volatile organic compounds (VOCs), primarily trichloroethene (TCE) and tetrachloroethene (PCE). Mr. Wildermuth was responsible for the development of groundwater flow and transport models to determine the source(s) of these contaminants and the approximate period of loading.

Surface and Groundwater Studies from Discharge of Recycled Water, City of San Bernardino Municipal Water Department

Mr. Wildermuth conducted numerous studies to evaluate receiving water impacts in surface water and groundwater from the City of San Bernardino's recycled water discharge to the Santa Ana River. These studies involved surface and ground water modeling to determine the nitrogen and TDS impacts of various recycled water discharge alternatives on surface water and the groundwater basins that are recharged by those surface waters.

Surface Water Modeling Studies, City of San Bernardino Municipal Water Department

Mr. Wildermuth conducted surface water modeling studies to estimate the discharge, TDS, and nitrogen impacts on the Santa Ana River from various recycled water marketing alternatives proposed by the City of San Bernardino.

Water Use Audit and Water Resources Development, Rancho Mission Viejo

Mr. Wildermuth conducted a water use audit of Rancho Mission Viejo and developed a phased plan of study for the development of water resources for the Ranch as land is converted from agricultural to urban uses.

Preparation of Application to Divert Water, Rancho Mission Viejo

Mr. Wildermuth prepared an application to divert water by appropriation and the supporting environmental documentation. Impacts to downstream water users were evaluated and mitigation plans were developed. Mr. Wildermuth also participated in negotiations for the sale of diverted water to local agencies.

Evaluation of Proposals, URS Consultants (for the Santa Ana Watershed Project Authority)

Mr. Wildermuth evaluated the impacts of various waste discharge proposals for the Western Riverside Regional recycled water plant on surface and groundwater resources in the upper Santa Ana Basin.

Saline Plume Management Alternatives, Kaiser Steel Resources

Mr. Wildermuth developed saline plume management alternatives in the Chino Basin for Kaiser Steel Resources. This work involved groundwater modeling and water quality sampling. Solutions included pump and treat alternatives and a salt-offset alternative. In addition to developing the salt-offset alternative, Mr. Wildermuth assisted Kaiser in moving this solution through the regulatory process, saving Kaiser over $40 million.

Conjunctive Use Plan Study, Western Municipal Water District, San Bernardino Municipal Water District, City of San Bernardino, and Orange County Water District

A10-94 cont'd

Mr. Wildermuth developed conjunctive use plans for the management of local, imported, and recycled water above Riverside Narrows.

Montgomery Watson (aka James M. Montgomery, Consulting Engineers [JMM]) – 1987 to 1990

Mr. Wildermuth served as the manager of Water Resources studies at JMM's Irvine office. Mr. Wildermuth was also the manager and lead-modeling specialist for the *TDS and Nitrogen Studies, Upper Santa Ana Watershed.* Responsibilities included the development of a comprehensive work plan and the modification, calibration, and use of the Santa Ana Basin Planning models to evaluate future TDS and nitrogen management plans. Mr. Wildermuth developed a series of models to simulate the fate of agricultural leachates in the vadose zone and the saturated zone for the 1900 through 2015 period and a software link between the river quality model (QUAL2E) and the Basin Planning models. Mr. Wildermuth participated in the development and evaluation of eight management plans.

Water Quality Management Plan, Western Municipal Water District, San Bernardino Municipal Water District, City of San Bernardino, and Orange County Water District

Mr. Wildermuth was the project manager for the development of a water quality management plan for the Colton and Riverside Groundwater Basins. Mr. Wildermuth developed a detailed work plan that focused on moving various water management entities towards consensus on a basin management plan. The study involved the use of groundwater flow and quality models and public participation.

Groundwater Mining Studies, Southern Nevada Water Management Study

Mr. Wildermuth was the lead-modeling specialist in the evaluation of the groundwater mining studies of the Rail Road Valley and California Wash Basins in Nevada.

Integration of Surface and Groundwater Models, Wyoming Attorney General

Mr. Wildermuth was the lead-modeling specialist for the integration of surface and ground water models of the North Platte River. The purpose of this project was to evaluate the effects of river depletions due to agriculture and to evaluate reservoir management plans.

Conjunctive use Study, City of Santa Barbara

Mr. Wildermuth was project manager and lead-modeling specialist for a conjunctive use study for the City of Santa Barbara. Mr. Wildermuth developed conjunctive use alternatives that involved recharging surface water from the Santa Ynez River (by injection and spreading), the injection of recycled water, and in-lieu recharge concepts. Mr. Wildermuth used groundwater models to evaluate the impacts of conjunctive use operations on groundwater.

Phase IV Groundwater Investigation, Kaiser Steel Resources

Mr. Wildermuth was the project manager of the Phase IV Groundwater Investigation at the Kaiser Steel Facility in Fontana, California. Mr. Wildermuth's role in this study was to develop remediation plans for two large plumes of degraded groundwater emanating from Kaiser. Mr. Wildermuth directed the study team's efforts, which included water quality sampling, drilling monitoring wells, groundwater modeling and engineering studies.

QUAL2E Modeling Studies, Santa Ana River Dischargers Association

A10-94 cont'd

Mr. Wildermuth was involved in the review of the QUAL2E modeling studies performed by the Santa Ana Regional Water Quality Control Board. Mr. Wildermuth's responsibility in this study was to provide an independent review on behalf of the Santa Ana River Dischargers Association. The key issue of this study was a determination of QUAL2E model reliability for establishing waste load allocations for point discharges with an emphasis on nitrogen species.

Camp Dresser & McKee, Inc. – 1980 to 1987

700,000 Acre-ft Groundwater Storage Program, Metropolitan Water District of Southern California

Mr. Wildermuth was the project manager and lead analyst for the 700,000 acre-ft Chino Basin Groundwater Storage Program. Mr. Wildermuth's responsibilities included assisting Metropolitan with the formulation of storage program alternatives, the development and implementation of state-of-the-art models for non-point source groundwater contamination and regional vadose zone modeling, the application of these models to evaluate the groundwater level and water quality impacts from a large groundwater storage program, conducting workshops with stakeholders, and the preparation of the environmental impact report.

TCE/DBCP investigation, Santa Ana Watershed Project Authority

Mr. Wildermuth was the project manager and lead analyst for a TCE/DBCP investigation in the Redlands area. Field studies were designed and implemented to estimate the then current TCE and DBCP conditions in the area, and a three-dimensional model was developed to predict the fate of TCE and DBCP under various management alternatives. Alternative mitigation measures were developed and evaluated.

Safe Yield and Groundwater Management Study, Cucamonga County Water District

Mr. Wildermuth was the project manager and lead analyst for a safe yield and groundwater management study for the Cucamonga Groundwater Basin. Mr. Wildermuth developed and calibrated a three-dimensional groundwater model to evaluate the impacts of artificial recharge, in-lieu recharge, and drought management programs. Mr. Wildermuth developed a detailed monthly hydrology of the Cucamonga Basin for use in safe yield estimates, groundwater model calibration, and water supply management.

Chino Basin Storage Program Feasibility Study, Department of Water Resources

Mr. Wildermuth was a project engineer for the Chino Basin Storage Program feasibility study. Responsibilities included an evaluation of the availability of surplus State Project water for conjunctive use and an evaluation of the correlation between local flood flows and surplus state project water.

Groundwater Modeling Study, Regional Water Quality Control Board

Mr. Wildermuth was a project engineer for the Santa Ana Regional Board groundwater modeling study of the 400,000-acre Upper Santa Ana Groundwater Basin. Responsibilities included a complete rewrite and calibration of the groundwater hydraulic and water quality codes. These models were used to investigate revisions to the Upper Santa Ana Basin Plan.

Water Flow and Demand Projection Study, City of Scottsdale

Mr. Wildermuth was a project engineer for a water demand and recycled water flow projection study for the City of Scottsdale. Various potential land use scenarios were analyzed to develop ultimate water demands and recycled water flows. Potential supplies included Central Arizona Project water, groundwater, and recycled water. Mr. Wildermuth developed a comprehensive and fully interactive computer model to conduct the analysis. The unit factors for indoor and outdoor water demand and the parameters defining waste flow were estimated by calibrating the computer model in a selected area of Scottsdale.

A10-94 cont'd

Groundwater Study, Occidental Chemical

Mr. Wildermuth was a project engineer for a detailed groundwater study of a toxic spill site near Lathrop, California for Occidental Chemical. This study involved the use of a two-dimensional, multi-layer groundwater model to predict pollutant movement with and without mitigation plans.

Shallow Groundwater Management Program, The Irvine Company

Mr. Wildermuth was the project manager for a study to develop a shallow groundwater management program for the Irvine Subbasin. This study resulted in a recommendation to control and/or mitigate shallow groundwater in an urbanized area.

Phase II Irvine Subbasin Study, The Irvine Company

Mr. Wildermuth was the project manager for the Phase II Irvine Subbasin study. This study focused on the development and analysis of water use plans for the Irvine Subbasin.

Flood Control Study, The Irvine Company

Mr. Wildermuth was the project manager and lead analyst for a flood control study of San Diego Creek in the City of Irvine. This study analyzed flood plain development and channel improvement alternatives.

Flood Control Planning Study, Army Corps of Engineers

Mr. Wildermuth was a project engineer for the flood control planning studies in support of the Central Arizona Water Control Study. Mr. Wildermuth performed the hydraulic design and cost estimates for reservoir flood outlets and levee systems on the Salt River and selected bridges on the Salt River. The impacts of sand and gravel operations within the Salt River were also evaluated.

Mr. Wildermuth also conducted numerous river-engineering studies in Southern California for the Army Corps of Engineers.

TetraTech – 1976 to 1980

HEC-1, HEC-2, & TR-20, Florida and Texas

Mr. Wildermuth was the project engineer for numerous flood insurance studies in Florida and Texas, specializing in the use of HEC-1, HEC-2, and TR-20. And, Mr. Wildermuth applied special-purpose dam flood wave routing models and the HEC-6 model for the hydrologic evaluation of flood safety for a nuclear power plant.

A10-94 cont'd

Los Angeles County Flood Control Department – 1974 to 1976

Studies for the Storm Drain System of the Laguna Regulating Basin

Mr. Wildermuth conducted design hydrology and hydraulic studies for a storm drain system and collaborated in a PMF spillway adequacy study for the Laguna Regulating Basin. This study included the development of runoff model parameters and the conceptual development of a serial reservoir flood routing computer model. Mr. Wildermuth also developed a semi-self-calibrating watershed model.

This conceptual model was used by the Hydraulic and Hydrology section for spillway studies in the late 1970s and early 1980s.

Affiliations / Organizations

American Water Resources Association

National Groundwater Association

Groundwater Resources Association

Wenbin Wang, PhD, PG

Principal Hydrogeologist



Assignment

Principal Hydrogeologist

Education

Ph.D., Subsurface Hydrology/ Mathematics, University of Arizona, Tucson, 2002

M.S., Hydrogeology, Chengdu University of Technology (CDUT), China, 1989

B.S., Hydrogeology, CDUT, China, 1984

Dr. Wang, a principal hydrogeologist at Wildermuth Environmental, Inc. (WEI), has over 25 years of professional experience in the field of hydrogeology. His technical expertise includes the development of hydrological-hydrogeological conceptual models for complex surface and subsurface water systems; numerical modeling of multiphase flow and contaminant transport in saturated and unsaturated porous and fractured mediums; developing flow and transport codes; designing Windows-based software; estimating hydraulic parameters via direct and indirect methods; applying statistics, geostatistics, and stochastic methods in hydrogeology; sensitivity and error analysis; and site/basin scale characterization.

Dr. Wang is well-versed in various modeling software applications, including TOUGH2/ITOUGH2, MODFLOW, PEST, MT3D, PATH3D, MODPATH, FLOWPATH, HYDRUS-1D/2D, UNSAT, HEC, GSLIB, ROSETTA, AQTESOLV, PHREEQC, and MINTEQ. In addition, he is highly proficient in several major programming languages, including Fortran, Visual Basic, Java, and C#. Dr. Wang has developed multiple groundwater flow and transport codes and is the author of U-Win software—a user-friendly, unsaturated flow code that is applied in heap leach mining. He has also developed several regional hydrogeological conceptual and numerical models to solve complex water resources and water quality problems. Specifically, since joining the WEI, Dr. Wang has developed regional flow and transport models for the Chino Basin, Beaumont Basin, Arlington Basin, Mammoth Lakes Valley, San Bernardino Basin, Strand Ranch, and the Palmdale area.

Prior to joining WEI, Dr. Wang served as a hydrogeologist with the China Geological Survey and a lecturer and associate Professor of Hydrogeology at the Chengdu University of Technology and worked as a hydrogeologist at an Arizona-based water management consulting firm.

Dr. Wang received a B.A. in Hydrogeology from the Chengdu University of Technology in 1984, an M.S. in Hydrogeology from the Chengdu University of Technology in 1989, and a Ph.D. in Subsurface Hydrology from the University of Arizona in 2002. He is a member of the American Geophysical Union, the Soil Science Society of America, the Groundwater Resources Association of California, and the National Groundwater Association. Dr. Wang is a licensed professional geologist in the State of California.

A10-94 cont'd

Selected Project Experience

Wildermuth Environmental, Inc. – 2004 to Present

2010 Alternative Dispute Resolution, Evaluation of Well Pump Test Data in the Cadiz Area

Principal Scientist: Dr. Wang reviewed disputed aquifer tests and different explanations, analyzed related geologic-hydrogeologic information and various pumping test data in the unconfined alluvium and deep carbonate aquifer system, and estimated hydraulic parameters.

2010 Strand Ranch Groundwater Model Development, IRWD

Principal Hydrogeologist/Chief Modeler: Dr. Wang analyzed several pumping tests in the unconfined and semi-confined aquifer systems, estimated various hydraulic parameters, and developed the hydrogeological conceptual and numerical models to evaluate various artificial recharge and pumping scenarios.

Chino Basin 2009 Production Optimization and Evaluation, Chino Basin Watermaster

Principal Hydrogeologist/Chief Modeler: To improve water management in the Chino Basin and to efficiently use water resources to meet increasing water demands,

a series of numerical flow and transport models were developed and calibrated using historical data. These models were then used to design optimum basin management scenarios and to evaluate each proposed scenario and alternative that met the water demand of the cities in alignment with the maximum benefit over the next 30 years. The proposed water replenishment and production scenarios had to meet a set of restrictions, including the water demands of 23 water appropriators, the facility capacity of 17 recharge basins, the pumping limitations of hundreds of water supply and desalter wells, the availability of imported water, and related water codes and regulations. Each planned alternative was evaluated to determine changes in groundwater levels, changes in basin outflow, the effectiveness of hydrological control, changes in the safe yield, changes in water quality, and potential subsidence and environmental problems.

The final selected plan maximizes water resources and financial benefits, minimizes discharge from the basin, protects water resources from pollution and degradation, optimizes the pump-and-treat system for site remediation, avoids possible potential subsidence, and will not impair downstream beneficial uses of the Santa Ana River.

2008-2009 Chino Basin Hydraulic Control Report, Chino Basin Watermaster

Chief Modeler, Dr. Wang evaluated different artificial recharge and production scenarios, including water banking or the Dry-Year Yield program, to maximize water recharge from the Santa Ana River, to avoid potential material damage due to production, and to reach hydrologic control with the minimization of groundwater outflow.

Regional Groundwater Model Development, Palmdale Water District

Associate Scientist/Chief Modeler: Dr. Wang developed regional hydrogeological conceptual and numerical models to evaluate various scenarios of recharge, pumpage, and water banking over next 50 years.

A10-94
cont'd

Chino Basin Groundwater Model Recalibration, Chino Basin Watermaster

Associate Scientist/Chief Modeler: Dr. Wang re-developed the regional hydrological-hydrogeological conceptual model and numerical models; developed solute transport models for PCE, TCE, TDS, and nitrate; calibrated hydraulic parameters using WEI's 26-processor computer system; assisted in the design of various scenarios related to imported water and water banking over the next 100 years; and drafted the model documentation.

Contaminated Groundwater Remediation, Chino Basin Watermaster

Chief Modeler: Dr. Wang developed MT3D models for existing groundwater contamination plumes (PCE, TCE, TDS) in the Chino Basin; designed hydrological control and contaminant remediation pumping scenarios for the Chino Airport plume, the Ontario plume, the GE plumes, and the Kaiser Steel Fontana plume; and conducted various simulations of PCE, TCE, and TDS plume movement.

Mammoth Basin Groundwater Flow Model Development, Mammoth Community Water District

Principal Scientist/Chief Modeler: Dr. Wang developed regional hydrological-hydrogeological conceptual models (surface water and groundwater) and numerical models, calibrated hydraulic parameters using WEI's 26-processor computer system, conducted various simulations for the next 50 years to optimize water resources management, and drafted the project report.

RIX Expansion, Carollo Engineers

Principal Scientist/Chief Modeler: Dr. Wang developed site-scale variable saturated flow and transport models, developed local hydrogeological conceptual and numerical flow models along the Santa Ana River, and drafted the project report.

Arlington Basin Groundwater Flow Model Development, Western Municipal Water District

Associate Scientist/Chief Modeler: Dr. Wang developed regional groundwater flow and solute transport models for the Arlington Basin, conducted inverse modeling, designed various water/recycled water input planning scenarios, and drafted the project report.

Beaumont Basin Groundwater Flow Model, Beaumont-Cherry Valley Water District

Senior Scientist/Principal Investigator: Dr. Wang developed a regional, unsaturated and saturated zone groundwater flow and solute transport model; conducted inverse modeling using PEST parallel computing; designed and evaluated various future water/recycled water input scenarios with/without sewer systems; developed and ran solute transport models for TDS, nitrate, and other constituents; evaluated various future planning scenarios; and drafted the project report.

Contaminant Source Investigation: Newmark Groundwater Contamination Superfund Site, Confidential Client

Senior Scientist/Principal Investigator: Dr. Wang developed regional and local hydrogeological conceptual models for the unsaturated and saturated zones, conducted various flow and contaminant transport simulations in the unsaturated zone of the Cajon Landfill Site and regional solute transport simulations in the San Bernardino Basin, determined the source of the Newmark contamination plume, and drafted the project report.

Chino and Ontario Airport Plume Simulation and Remediation, Chino Basin Watermaster

Senior Scientist/Principal Investigator: Dr. Wang conducted flow and transport modeling based on existing contamination plumes, developed a regional flow model, and determined optimum remediation scenarios.

A10-94 cont'd

Title 22 Engineering Report, Chino Basin Watermaster

Senior Scientist/Chief Modeler: Dr. Wang conducted various recycled water input/movement simulations in the Chino Basin and determined the optimum scenario for distributing recycled water in various recharge basins.

RIX Expansion Engineering Support, Carollo Engineers

Senior Scientist/Chief Modeler: Dr. Wang estimated the unsaturated and saturated hydraulic properties of the RIX site, characterized site hydrogeology, developed conceptual models, conducted unsaturated and saturated flow modeling, and determined the optimum scenario of infiltration and extraction.

Water Management Consultants, Tucson, Arizona – 2002 to 2004

Hydrogeologist/Chief Modeler: At Water Management Consultants, Dr. Wang completed more than 10 research/consulting projects. Specifically, Dr. Wang conducted forward and inverse flow and transport modeling in heterogeneous unsaturated/saturated porous and fractured media; performed geostatistical analyses and simulations; designed and analyzed pumping/slug and tracer tests; performed hydraulic parameter estimation and site characterizations; and developed heap leaching technology, including a geophysical monitoring system. In addition, he was responsible for computing and maintaining very large geophysical databases; computing 3-dimensional ERT; designing software, including the development of U-Win; and programming for flow and solute transport and hydrogeochemical analyses.

University of Arizona, Department of Hydrology and Water Resources – 1997 to 2002

Research Associate/Assistant: Dr. Wang conducted groundwater flow and transport model testing and uncertainty analyses related to hydrogeological conceptualization, modeling, and predictions; applied various parameter estimation approaches to interpret and evaluate hydrogeologic data from the Maricopa site; designed conceptual as well as flow and transport models; developed various codes for flow and transport; conducted geostatistical analyses of hydraulic parameters and pedological data; conducted geostatistical simulation; performed forward and inverse numerical modeling of multiphase flow and transport in heterogeneous unsaturated and saturated porous media; performed sensitivity and error analyses and uncertainty analyses of flow and solute transport modeling results; and designed field experiments. Dr Wang was also responsible for Maricopa area GIS, site characterization, pedotransfer function analysis, and Bayesian update coding and computations.

Chengdu University of Technology (CDUT), Department of Hydrogeology and Engineering Geology, China – 1989-1996

Lecturer/Associate Professor: Dr. Wang served as a Lecturer from 1989 to 1994 and as an Associate Professor and the Director of the Hydrogeology Section from 1994 to 1996. His specific duties included lecturing on hydrogeology and hydrogeochemistry and conducting and managing various research projects (more than 10 National Key Projects), including site characterizations of hydrogeology and geology at the first nuclear waste disposal site in China, paleo-hydrogeological analyses, oil basin and oil reservoir analyses, fluid flow and transport modeling, and complex hydrogeochemistry programming and computations of the East China Sea and the Biyang and Sichuan Basins. Furthermore, he was the principal researcher in determining the location of the ChunXiao-1 Well, the first oil field well in the East China Sea.

A10-94 cont'd

Chengdu University of Technology (CDUT), Department of Hydrogeology and Engineering Geology, China – 1986 to 1989

Research Assistant: Dr. Wang identified parameters and modeled groundwater flow in fractured karst medium.

China Geological Survey, China – 1984 to 1986

Hydrogeologist: Dr. Wang conducted geological and hydrogeological investigations, created maps; conducted pump tests, and collected soil and water samples.

Selected Publications

Wang, W., Wildermuth, M., McCarthy, T., Hwang, J., & Malone, A. (2009). *A Comprehensive Strategy of Hydrogeologic Inverse Modeling in Chino-Temescal Basin.* 2009 PEST Conference.

Wang, W., Neuman, S. P., Yao, T., & Wierenga, P. (2003). Simulation of Large-Scale Field Infiltration Experiments Using a Hierarchy of Models Based on Public, Generic, and Site Data. *Vadose Zone Journal, 2*, 297-312.

Wang, W., Neuman, S. P., Yao, T., & Wierenga, P. (2003). Comparative Simulations of a Large-Scale Field Infiltration Experiment. Proceedings TOUGH Symposium '03. Berkeley, California.

Wang, W., Zhang, X., Ren, T., & Wu, Y. (1997). The Hydrogeology of Hazardous Brine Injection Layers in Chishui Gasfield, Guizhou Province. In *The Study of Geological Environment* (45-55). Chengdu U of Science and Technology P.

Wang, W., Wu, X., & Ren, T. (1997). The Study of Hazardous Brine Chemical Characteristics and Brine Encrustation Mechanism in Chishui Gas-Field, Guizhou Province. In *The Study of Geological Environment* (74-84). Chengdu U of Science and Technology P.

Wang, W., & Wu, X. (1997). The Parameter Identification for Groundwater-Flow Modeling of Karst Aquifer System. *The Study of Geological Environment* (171-176). Chengdu U of Science and Technology P.

Wang, W., Wu, X., & Huang, Z. The Study of Oil-Field Water Chemical Characteristics and Oil Reservoir Preservation of a Certain Large Structure in the East China Sea. *Journal of the Xian Petroleum Institute, 10(1)*, 1005.

Wang, W. (1994). Paleohydrogeology. *Encyclopedia of Modern Science and Technology.* Beijing Press.

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Wang, W., Huang, Z., Wu, X., & Yu, Y. (1994). The Study of the Relationships Between Paleohydrodynamic Conditions and the Hydrocarbon Migration, Accumulation in a certain Large Structure of the East China Sea. *Journal of the Chengdu Institute of Technology, 21(2).*

Yang, L., Huang, Y., Yi, Y., & Wang, W. (1994). *Hydrogeology*.* Chengdu U of Science and Technology P. (*Textbook written in Chinese.)

Li, K., & Wang, W. (1993). Different Opinions of Water Resource Quality in the Coast Zone of Day Gulf. Proceedings *Symposium of Environmental System and Development Strategy in Coastal Areas of China.* National Seismic Press.

Wang, W., Sun, S., & Zhou, L. (1993). Computation of Inorganic Complex in Shallow Groundwater of Biyang Basin and a Study of a Search for an Oil/Gas Deposit. *Journal of the Chengdu Institute of Technology, 19(3).*

Wang, W., & Xu, Z. (1993). The Current State and Problems of a Paleohydrogeology Study of Petroleum Basin and the Solution Method. *Library and Petroleum Sci. Tech. Information, 17(4).*

Wang, W., & Zhou, L. (1993). *The Study Method and Flow Chart of Hydrogeologic Analysis in a Petroleum Basin. Journal of Henan Petroleum, 7(3).*

Wang, W., & Zhou, L. (1992). Paleohydrogeologic Analysis of; the Formation, Preservation and Disruption of Oil./Gas Deposits in the Biyang Depression. *U. of Southwest China Petroleum Institute, 14(2).*

Wang, W., & Ren, T. (1991). The Study of a Gray Predictive Model of Karst Groundwater System in Pudding Guizhoou Province. *Journal of the Chengdu Institute of Technology, 18(3).*

Xu, Z., Sun, S., & Wang., W. (1991). The Relationship Between Tectonic Stress Field and the Moving and Distribution of Mineralization Fluid (Groundwater). *Journal of the Chengdu Institute of Technology, 178(3).*

A10-94
cont'd

Affiliations / Organizations

American Geophysical Union

Soil Science Society of America

Groundwater Resources Association of California

National Groundwater Association

Comment Letter A10

Mammoth Community Water District
Post Office Box 597
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Mammoth Lakes, CA 93546
(760) 934-2596

February 20, 2013

VIA ELECTRONIC MAIL: cabipubcom@blm.gov

Mr. Collin Reinhardt, Project Manager
Casa Diablo IV Geothermal Development Project
U.S. Bureau of Land Management, Bishop Field Office
351 Pacu Lane, Suite 100
Bishop, California 93514

Re: Mammoth Community Water District's Supplemental Comments on the Casa Diablo IV Geothermal Project Draft EIS/EIR

Dear Mr. Reinhardt:

The Mammoth Community Water District (MCWD) submits the following supplemental comments on the Casa Diablo IV Geothermal Development Project (Project) Draft EIS/EIR (Draft EIS/EIR). These comments concern the following information received by MCWD after it submitted its preliminary comments on the Draft EIS/EIR on January 30:

- "Hydrologic and Geochemical Analyses of Reservoir Fluids in the Geothermal and Groundwater Systems in the Western Part of Long Valley Caldera" by M. Sorey (November 2011) (Sorey Report);
- "Long Valley Caldera/Casa Diablo Geothermal Reservoir Simulation Model: Peer Review" by S. K. Garg (August 2012) (Garg Report); and
- "Temperatures and Natural Gamma-ray Logs Obtained in Boreholes MLGRAP #1 and #2, Mammoth Lakes, California: Data and Preliminary Interpretations" by W.H. Diment and T.C. Urban (Open-File Report 90-460) (Diment & Urban Report).

A10-95

MCWD continues to maintain that the Draft EIS/EIR is inadequate because it lacks critical information necessary to form proper conclusions regarding the Project's potential impacts on the coldwater system tapped by MCWD's production wells. There remains to be a lack of substantial evidence in the Draft EIS/EIR, its appendices and supporting documents to support the significance conclusions pertaining to potential impacts of concern to MCWD. This assessment is based on the review of the Draft EIS/EIR (which was discussed previously in MCWD's January 30 comment letter) and of the above-referenced documents conducted by MCWD's hydrogeology consultants Mark Wildermuth, Wenbin Wang and Kenneth D. Schmidt. Mr. Wildermuth's, Mr. Wang's and Mr. Schmidt's comments are attached to this letter and are incorporated herein as part of MCWD's supplemental comments.

I. General Comments

As Mr. Wildermuth and Mr. Wang point out in their letter, one significant concern is that the shallow coldwater aquifer system currently being utilized by MCWD could be impacted by the Project. The Draft EIS/EIR concludes that the shallow coldwater aquifer is hydraulically separated or isolated from the geothermal system, and expanded geothermal production therefore will not impact MCWD's groundwater production wells or MCWD's ability to pump groundwater. (See Wildermuth Letter, p. 2.) However, discussions contained in the Sorey Report suggest both the movement of shallow cold groundwater flowing into the same aquifer system as the geothermal water and the connectivity of the two systems. (*Id.*, at p. 3.) Moreover, Mr. Schmidt indicates in his letter that the Sorey Report focuses almost entirely on the possible flow of hot water into the coldwater aquifer, but not on the downward flow of such cold water into the geothermal water. (Schmidt Letter, p. 3.) The chemistry of geothermal water beneath Mammoth Lakes is crucial to drawing conclusions concerning this downward flow, but yet none of this information is provided. (*Id.*) Additional geologic, piezometric and chemistry data clearly is needed from the well/borehole-free zone lying between Basalt Canyon and MCWD's production wells to determine if the Project will impact the shallow coldwater aquifer system utilized by MCWD's production wells. (Wildermuth Letter, p.3.) A10-96

It bears noting that issues respecting the separation between the shallow coldwater aquifer and deeper aquifers and related areas of concern also were raised by Christopher Farrar of the U.S. Geological Survey in his comments concerning the environmental documents for the Basalt Canyon Geothermal Pipeline Project. These comments are enclosed for your review and, to the extent they apply or relate to the deficiencies of the Draft EIS/EIR identified by MCWD, are made a part of MCWD's supplemental comments.

The information provided in the Garg Report also is insufficient to support the significance determinations in the Draft EIS/EIR concerning groundwater resources. As stated in Mr. Wildermuth's and Mr. Wang's letter, the Garg Report does not provide any information regarding how the geothermal reservoir simulation model was calibrated, nor does it provide any sensitivity studies relating to model parameters and assumptions or an assessment that the calibrated model parameters lie within a reasonable range. These missing pieces of information constitute serious omissions in a peer review report such as the Garg Report. (See Wildermuth Letter, p. 6.) Moreover, the Garg Report does not provide any new information regarding the hydraulic separation of the shallow coldwater aquifer system. To the contrary, it confirms that the simulation model was not calibrated in the area between Basalt Canyon and the MCWD well field, but rather in the area of the existing Casa Diablo well field, and that the less-than-rigorous review in the report was limited by time and budget considerations. (See *id.*, at p. 6-7.) A10-97

In his letter, Mr. Schmidt explains why the Sorey Report, the Garg Report and the Diment & Urban Report do not support the certainty of the determinations expressed in the Draft EIS/EIR, especially with respect to the assumed "impermeable barrier" between the geothermal reservoir and coldwater aquifer. (Schmidt Letter, p. 6.) Without the various categories of critical data described by Mr. Schmidt, Mr. Wildermuth and Mr. Wang that are still needed to fully assess the potential impacts of the Project to the coldwater system tapped A10-98

by MCWD's production wells, there simply is no way for MCWD to evaluate independently and meaningfully the Draft EIS/EIR. A10-98 cont.

II. Unavailability of Modeling Information

As of this writing, the lead agencies and the Project proponent continue to refuse to provide essential modeling information — an acceptable conceptual model description, numerical reports, input and output files, model assumptions, calibration information, model predictions — used as the basis for the significance determinations contained in the Draft EIS/EIR. As previously stated in MCWD's January 30 letter, the hard data on which public agencies base their conclusions must be provided, and an environmental document cannot rely on information that is neither included in the document nor described or referenced therein. (See *Idaho Sporting Congress v. Thomas* (9th Cir. 1998) 137 F.3d 1146, 1150 (reversed on other grounds by Lands Council v. McNair (2008) 537 F.3d 981, 997); *Vineyard Area Citizens for Responsible Growth v. City of Rancho Cordova* (2007) 40 Cal.4th 412, 442, underlining added.) Such continued refusal to share the data requested by MCWD precludes meaningful public review and understanding of the Project's potential impacts. A10-99

III. Conclusion

In summary, MCWD finds that the Draft EIS/EIR is legally deficient under both the National Environmental Policy Act and the California Environmental Quality Act because it fails to provide critical information necessary to form proper conclusions regarding the Project's potential impacts on the coldwater system tapped by MCWD's production wells. This conclusion is supported by the analysis provided in the enclosed comment letters and attachments. A10-100

Sincerely,

John Pedersen

John Pedersen, PE
Interim General Manager
Mammoth Community Water District

Encls: Comment Letter from Kenneth D. Schmidt (with attachment)
Comment Letter from Mark Wildermuth and Wenbin Wang (with attachment)
Comments from Christopher Farrar, Basalt Canyon Geothermal Pipeline Project

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February 20, 2013

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Interim General Manager
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Re: Casa Diablo IV Geothermal
Project Draft EIS/EIR

Dear John:

Following are additional comments on the Draft EIS/EIR for the Casa Diablo IV Geothermal project. The following three additional documents were provided to me since my initial comment letter of January 30, 2013.

1. "Long Valley Caldera/Casa Diablo Geothermal Reservoir Simulation Model: Peer Review" by S. K. Garg, August 2012 (Garg report).

2. "Hydrologic and Geochemical Analyses of Reservoir Fluids in the Geothermal and Groundwater Systems in the Western Part of Long Valley Caldera" by M. Sorey (November 2011).

3. "Temperatures and Natural Gamma-ray Logs Obtained in Boreholes MLGRAP #1 and #2, Mammoth Lakes, California: Data and Preliminary Interpretations" by W. H. Diment and T. C. Urban (Open-File Report 90-460).

<u>Garg Report</u>

The pages weren't numbered, so I added page numbers to my copy for reference. The disclaimer in the last paragraph of Page 1 indicates that this report was based on only a "limited review", and that "we may not have identified all issues that may need additional analyses". This indicates that there is uncertainty about the critical conclusions.

Figure 1 The numbers on this map are so small that they cannot be read. A10-101

Figure 3 The location of this cross section wasn't provided. The vertical scale for the "lithologic column" wasn't clearly provided. The "landslide block" was only indicated at two of the wells, and was apparently only about 40 to 70 meters thick at each of these. No significant barrier is indicated, either laterally or vertically, as was stated in the DEIS/EIR. This section isn't directly applicable to the District supply wells, as they tap interlayered basalt fill to a depth of about 700 feet (about 210 meters). A10-102

Figure 5 The location of the cross section wasn't provided. A number of steeply dipping faults are shown for the Western Caldera Ring Fault System extending from west to east over a lateral distance of more than a mile. No impermeable barrier is indicated on this section, although such a barrier was widely referred to in the Draft EIS/EIR. Such a section would be useful through the District well field, indicating the locations of District supply wells and faults in the vicinity. A10-103

Figure 7 The map is essentially on a 3"x2" part of the page and is largely unreadable. A10-104

Page 11 First paragraph. "The Early Rhyolite units..., with the Paleozoic landslide block constitute a more or less impermeable barrier between the groundwater aquifer and the underlying geothermal reservoir...". This indicates that there may not be the impermeable layer indicated in the Draft EIS/EIR. A10-105

Figure 11 Again, the map is on only about a 2"x3" part of the page and can't be read. A10-106

Page 13 The overlying materials of interest to the District are layers of basalt and till, not just till/alluvium. "This barrier may be breached by faulting...". Of particular importance to the District is where this breach is and where downward flow of cold groundwater occurs. This is important because the proposed geothermal development could result in more inflow of this groundwater into the geothermal water, resulting in its loss to the District. A10-107

Page 14 Based on available information, the reference to Sorey 2011 b (italics) could be reworded to say that the evidence is A10-108

non-consistent or non-conclusive. Sorey's evaluation was primarily of the possibility of hot water flowing upward or laterally into the cold water, as opposed to downward flow of cold water to the hot water, which is our main concern. A10-108 cont.

Figure 16 The Basalt Canyon geothermal production apparently started in 2006, but no results of specific hydrologic monitoring of the cold groundwater associated with this production were discussed in the DEIR/EIS or other documents that have been provided. Attachment 1 is a water-level hydrograph for MCWD Well No. 26 from our last annual report. There was a noticeable drawdown in this well after mid-2008, compared to before. This could be due to geothermal production in Basalt Canyon, indicating a connection between groundwater tapped by Well No. 26 and the geothermal resource. This well was installed to tap relatively warm groundwater between 621 and 686 feet in depth. This is the closest district monitor well to the Basalt Canyon area, and the water-level monitoring results definitely should have been included and evaluated in the Draft EIS/EIR. A10-109

Page 34 Conclusion No. 2. "The unconformity provides an impermeable barrier". In the Draft EIS/EIR (Page 37-6), the Upper Early Rhyolite was stated to be the barrier. The stable water isotope and fluid chemistry data used were primarily for the cold groundwater, in term of possible upward flow of hot groundwater. The evidence for downward flow of cold water would be in the geothermal water, which wasn't sampled for the geothermal wells in the Mammoth Lakes area. The fourth well (Gomez) wasn't even mentioned in the Draft EIS/EIR. Thus important information on geothermal water in Mammoth Lakes wasn't included. A10-110

Sorey Report

Page 2 Last paragraph, first sentence. The report indicates that the evidence of an interconnection is inconsistent or inconclusive. The report focuses almost entirely on the possible flow of hot water into the cold water, but not on the downward flow of the cold water into the geothermal water. The chemistry of geothermal water beneath Mammoth Lakes is crucial in drawing conclusions on this downward flow. However, this information was not indicated to be available. A10-111

Figure 1B The MCWD monitors a number of supply wells and monitor wells, almost all of which were not shown on this diagram. A10-112

Figure 3 This is apparently one of MCWD's water-level maps, but A10-113

it was not referenced.

Page 5 First paragraph. The report states that "no fluid samples were collected from the four geothermal wells drilled in the Mammoth Lakes area". This is a fatal flaw in the data necessary to draw conclusions about an "impermeable barrier". That is, information on the quality of the geothermal water beneath Mammoth Lakes is crucial to evaluate the extent of such downward flow of cold water. A10-114

Page 13 Water-level trends in SC-2 are not necessarily applicable to District Supply Well 17. Frequent water-level measurements are available for Well 17 and other MCWD wells that are much closer to Well 17, and these should have been used in the evaluation. SC-2 is too far distant from Well 17 to provide meaningful information about water levels in Well 17 or nearby. A10-115

Page 14 Second full paragraph. "... data from the 4 temperature gradient holes drilled in the NW corner of Mammoth Basin appear to penetrate a somewhat separate and lower temperature thermal water flow system located to the south of the main geothermal system". Such a concept wasn't clearly presented in the DEIS/-EIR. Also, regarding " ... suggest that geothermal fluids occur within this part of the basin at depths between 130 m and 670 m, for the most part considerably below the depths of screened intervals in the cold water production wells along the western side of the basin". The District supply wells constructed after 1976 (after Well No. 1), except for Well No. 18, have perforations or open holes extending to depths ranging from 670 to 720 feet. Thus part of the range of 130 m to 670 m overlaps parts of the perforated or open intervals in these wells. Therefore, there could be a lateral connection between geothermal fluids and cold water pumped from District wells. A10-116

Page 15 First paragraph. The term "satellite geothermal system was used. The discussion in the Draft EIS/EIR didn't clearly discuss the relation of this system to the other geothermal water and the cold water. Regarding the statement that "The available chemical, thermal, and hydrologic data tend to rule out the possibility that existing geothermal development has caused any measurable changes in conditions within the groundwater system of the Mammoth Basin". This is a surprising conclusion, given the statement in the Draft EIS/EIR about the influx of cold water into the geothermal water in the Casa Diablo area. A hydrologic connection is indicated in that area, and an influx of cold water A10-117

should have been indicated by water-level monitoring for the cold water.

Page 17 First paragraph. "There are no samples as yet run for stable isotopes for the Lakes Basin". This is incorrect, as we had a number of samples analyzed for the stable isotopes in this area as part of our evaluation of seepage from Horseshoe Lake. A10-118

Page 19 First full paragraph. "... there appears to be no reliable evidence of effects or impacts of some 25 years of geothermal development on water level or fluid chemistry in the MWCD production wells". First, water-level data for most of the District wells weren't used in drawing this conclusion. Certainly, the water-level declines in MCWD Well No. 26 should have been evaluated. Second, an important issue is the impact of this geothermal development, particularly in the Basalt Canyon area, on cold groundwater water levels. This was not discussed in the Draft EIS/EIR or the other documents subsequently provided. Water-level records for MCWD Well No. 26 indicate a noticeable drawdown occurred following the start of geothermal development in Basalt Canyon. A10-119

Page 20 Our 2002 report was referenced, as opposed to the most recent one available. Both the older and more recent data should have been used in the evaluation. A10-120

Diment & Urban Report

This report points out a number of problems associated with the two MLGRAP geothermal wells in Mammoth Lakes. Examples follow:

Page 2 Last paragraph. "We doubt that the annulus is completely filled with cement and suppose that fluid may flow along the annulus in this interval".

Third paragraph. "Problems of lost circulation, caving and stuck rods were severe (for MLGRAP No. 1)". A10-121

Figure 5 MLGRAP #1 was sealed only to a depth of 280 feet.

Figure 6 MLGRAP #2 was sealed opposite the conductor only to a depth of 200 feet. The lack of sealing these wells off opposite all of the cold water brings into doubt the interpretations drawn from these wells. It also brings into question statements

in the Draft EIS/EIR about how future geothermal wells in Basalt Canyon would be sealed. Why aren't similar well sealing problems expected in Basalt Canyon? A10-121 cont.

Table 4 Basalt and tuff were indicated in MLGRAP #1 to a depth of about 1,240 feet, well below the bottoms of the MWCD supply wells. At MLGRAP #2, these layers extended to a depth of about 890 feet, also below the bottoms of District supply wells. These aren't indicated to be impermeable. A10-122

Page 27 Last paragraph. "The annuli of most holes drilled in the Long Valley Caldera are not effectively sealed over their entire lengths, or even the major portion thereof". "Attempts to cement the annuli usually failed partially or completely". "There are many permeable formations that are capable of accepting large quantities of cement".

Page 28 First paragraph. "Fluid flow along the annulus is an important factor in determining the temperature-depth profiles in some boreholes. Indeed, fluid flow may be controlling the shapes of some characteristic profiles in the caldera". A10-123

These conditions could cause problems with data interpretation, such as exactly where the hot and cold groundwater were prior to hole drilling.

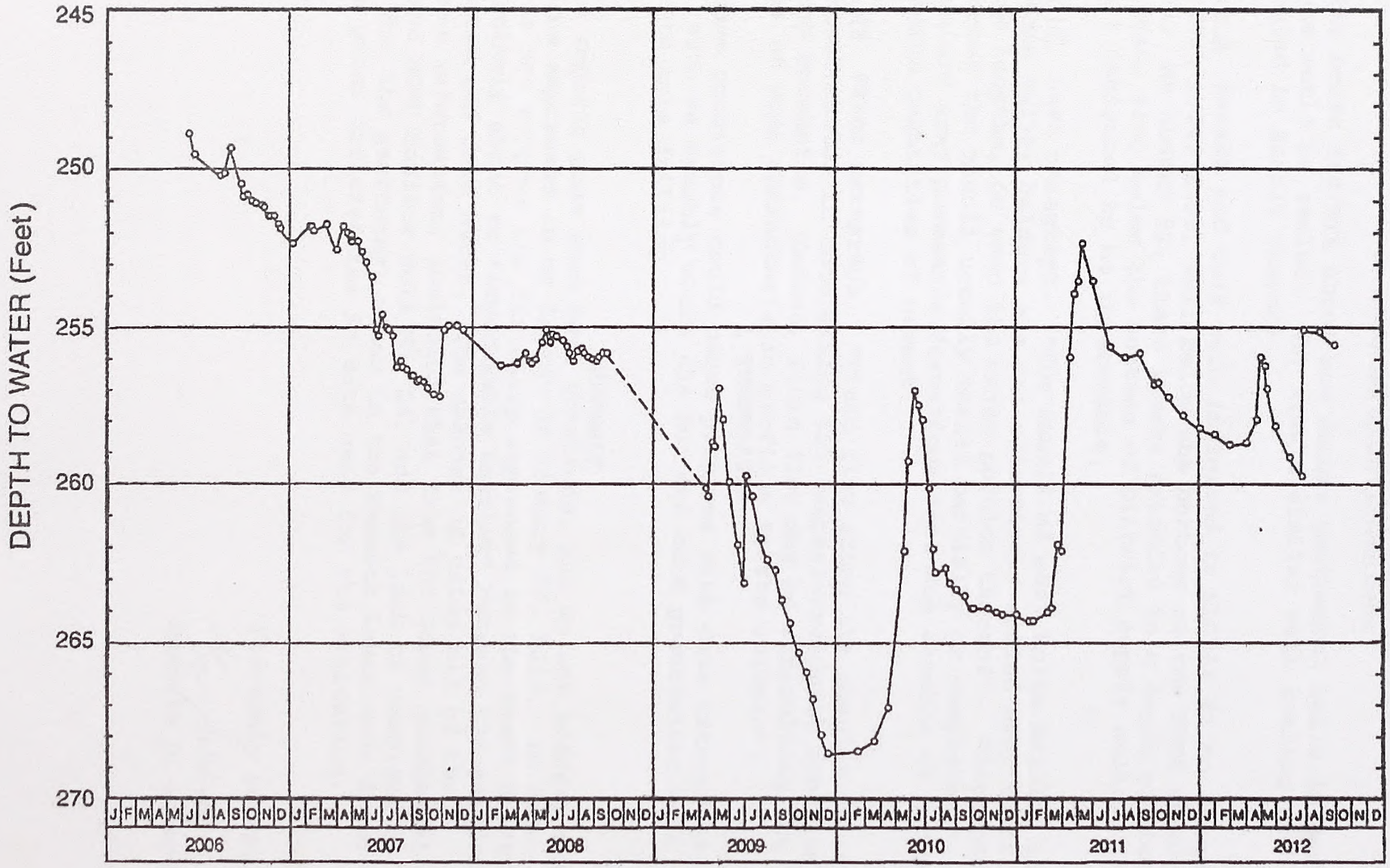
Summary

The reports pose even more questions, and do not address the concerns expressed in my letter of January 30, 2013. In fact, they do not support the certainty expressed in the Draft EIR/EIS, particularly about an "impermeable barrier" between the geothermal water and cold water. The absence of using all of the relevant information, including that from the Gomez geothermal well and MCWD monitor Well No. 26, and the lack of sampling results for the geothermal water in the Mammoth Lakes area demonstrate gross deficiencies in data used for the evaluation. A10-124

Sincerely yours,

Kenneth D. Schmidt

ATTACHMENT 1



WATER-LEVEL HYDROGRAPH FOR WELL NO. 26

WILDERMUTH™
ENVIRONMENTAL INC.

February 20, 2013

Mammoth Community Water District
John Pedersen, Interim General Manager
PO Box 597
Mammoth Lakes, CA 93546

Subject: ***Review of the Casa Diablo IV Geothermal Development Project, Public Draft Joint Environmental Impact Statement and Environmental Impact Report, Dated November 16, 2012 (DOI Control No.: DES 12-21, Publication Index No: BLM/CA-ES-2013-002+1793, State Clearinghouse No.: 2011041008) with reference to additional information received after our January 30, 2013 letter.***

Dear Mr. Pedersen:

Pursuant to your direction and Task Order No. 3, Wildermuth Environmental Inc. (WEI) reviewed the subject environmental document (ED). WEI reviewed these documents to assess the adequacy of their evaluation of the proposed project's potential impacts to the Mammoth Community Water District's (MCWD) water supply wells and to the cold groundwater system tapped by these wells, as well as to the surface hydrology which could affect the MCWD's ability to meet certain streamflow requirements.

The proposed project (Project) includes:

1. The construction and operation of 16 new geothermal wells, of which 14 will be located in Basalt Canyon. These new geothermal production wells will be drilled between 1,600 and 2,000 feet below ground surface (ft-bgs) and the associated injection wells will be drilled below 2,500 ft-bgs.
2. The injection wells will be located and operated to re-pressurize the geothermal reservoir and to dispose of the geothermal fluid. This balancing act will be figured out after the wells are constructed and from subsequent modeling.
3. An increase in geothermal production from the current production rate of about 12,000 to 18,000 gpm.
4. The Project Proponent proposes construction techniques that it believes will ensure that cold groundwater aquifers used for water supply will not be impacted, and that the BLM inspectors will be notified prior to constructing the actual well.

A10-125

The ED discussion in the sections entitled "Surface Water and Shallow Groundwater" on pages 3.7-10 and 3.7-11 and "Geologic and Geothermal Resources Technical Report," on

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pages D-25 through D-27 (Appendix D), concludes that the shallow cold-water aquifer in the Mammoth Groundwater Basin is separated from the deeper hotter geothermal system by impermeable intensely altered Early Rhyolite units in the west caldera and a landslide block in the south central caldera, and that geothermal production from the proposed Project is not expected to adversely affect the ability of the MCWD to produce groundwater from the shallow cold-water aquifer system. These conclusions are implied or directly stated in other places in the ED.

A10-125 cont.

WEI prepared comments on the ED and submitted them to Greg Norby, the former General Manager of the MCWD. Our basic conclusion is that the data and reports made available during the ED review period were not adequate to scientifically conclude that the proposed Project would not adversely impact the shallow cold-water aquifer system and the yield from that system used by the MCWD for water supply.

Our main concern is that the shallow cold-water aquifer system currently used by the MCWD could be impacted by declining piezometric levels in the geothermal system caused by new significant geothermal production in Basalt Canyon, and that will increase flow from the shallow cold-water aquifer system into the geothermal reservoir and subsequently reduce the groundwater supply to the MCWD. The Project Proponent believes, without scientifically-defensible evidence, that the shallow cold-water aquifer system is hydraulically separated or isolated from the geothermal system and therefore expanded geothermal production will not impact the MCWD wells or ability to pump groundwater. Our January 30, 2013 comment letter contains our opinion that, based on information made available to the public, the Project Proponent had not made a scientifically defensible case for the assumption of hydraulic separation and the finding of no significant impact to the shallow cold-water aquifer system used by the MCWD.

A10-126

Figure 1 attached shows the southwestern part of the Long Valley caldera, the MCWD production wells and monitoring wells, proposed Basalt Canyon well sites, and the location of various geothermal exploratory/production/monitoring wells. The proposed Project's geothermal well sites are only about two miles from District supply wells. The area between the proposed Basalt Canyon geothermal well field and the MCWD well field is conspicuously free of any type of well or borehole that could be used to characterize the hydraulic separation of the shallow cold-water aquifer system and the underlying geothermal system. There is no information in this well/borehole-free zone that substantiates the assumption of hydraulic isolation. Without such information, the conclusion of hydraulic separation between the geothermal system and cold-water aquifer in the area of the District supply wells is without scientific foundation.

A10-127

Subsequent to the preparation of our January 30, 2013 comment letter, the Project Proponent has made two documents available for review that included:

1. Sorey, M. (2011) Hydrologic and geochemical analyses of reservoir fluids in the geothermal and groundwater systems in the western part of Long Valley Caldera. Report prepared for Mammoth Pacific, L.P., November 2012.

2. Garg, S. (2012) Long Valley Caldera/Casa Diablo Geothermal Reservoir Simulation Model: Peer Review. Report prepared for Geologica, Inc., August 2012)

We have reviewed these documents and provide additional comments below. Our position, as stated in our January 30, 2013 letter, has not changed as a result of our review of the above documents.

The Sorey Report

The Sorey report summarizes conclusions from Sorey's review of chemistry and stable isotope data from various wells in the southern Long Valley caldera. The time period of these chemistry observations range from about 1996 through 2002 and August 2011. In sum, Sorey uses limited historical chemistry and stable isotope information to conclude that the sources of the shallow cold-water aquifer system and geothermal system may be different and that the occurrence of anomalously warmer groundwater in MCWD wells (16, 17, 18 and 20) producing from the cold-water aquifer system is conceivably caused by *"from either upward flow of hot water or just high conductive heat flow from an underlying region of hot water beneath this corner of the groundwater basin"* (Page 2, Sorey Report). In fact the chemistry of MCWD Well 17 has a clear signature of a partial geothermal source indicating that some of the anomalously high temperature is explained by some geothermal contribution to the well. This means that in the area near MCWD Well 17 that the shallow cold-water system is not hydraulically separated from the underlying geothermal system. A10-128

Sorey's analysis does not preclude that leakage occurs from the shallow cold-water aquifer system to the geothermal system in the area between Basalt Canyon and the MCWD well field. In fact Sorey states: *"For the geothermal system, the addition of cooler, more dilute groundwater, to the hottest geothermal fluid tapped by wells situated west of Casa Diablo yields thermal water with lower concentrations of cations (e.g. Cl, B, and Br), while not causing a change in cation ratios. This situation indicates a high of lateral hydrologic continuity within the upper couple of kilometers of the geothermal system, such that all thermal features (wells and springs) exhibit the same Cl/B and Cl/Br, ratios of 23 and 565, respectively* (Sorey et al, 1991, Farrar et al, 2003, and Table 2 of Sorey Report)."

A10-129

This citation from Sorey is evidence suggesting the movement of shallow cold groundwater flowing into the geothermal water and the connectivity of the two systems. It is not clearly known where the shallow colder groundwater and the geothermal systems combine. More geologic, piezometric, and chemistry data are required from the well/borehole-free zone that lies between Basalt Canyon and the MCWD production wells to determine if the proposed Project will impact the shallow cold-water aquifer system and correspondingly affect the yield of the MCWD supply wells.

Sorey never states definitively that the difference in chemistry of the shallow cold-water aquifer system and the geothermal system conclusively reflects hydraulic separation.

The Peer Review Report

The Peer Review Report purports to be a peer review of the numerical model, of which the Project Proponent and lead agencies will not allow public review, with the following stated goals:

> *"The main purpose of the SAIC review of the numerical model is to assure* (emphasis added) *that the expanded fluid production can be accommodated without adverse impacts on the local groundwater resources. More specifically, SAIC review considered the following aspects:*
>
> 1) *the soundness of the resource conceptual model*
> 2) *the appropriateness of model grid with respect to the geothermal field*
> 3) *the validity of boundary conditions*
> 4) *the quality of the initial state temperature and pressure match*
> 5) *the quality of the production history match*
> 6) *the reasonableness of model behavior during forecasts*
> 7) *overall quality of the model for simulating the response of the geothermal resource to expanded production*
>
> *The present report documents the results of peer review performed by SAIC. A word of caution is in order here. Because of time and funding constraints, it was possible to carry out only a limited review of the numerical model and relevant reports for the Long Valley Caldera/Casa Diablo geothermal field. As a consequence, we may not have identified all issues that may need additional analysis or could result in significant risk as a consequence of expanded fluid production."* (Emphasis added.)

A10-130

Seemingly, Mr. Garg's review could not be carried out at the level of detail required for him to have the same level of certainty in the assumed hydraulic separation of the shallow cold-water aquifer system from the geothermal system as is stated in the ED.

The Conceptual Model Description. The development of a conceptual model is the most important part of the modeling process. The conceptual model is the foundation of the quantitative mathematical representation of the field site, which in turn is the basis for the computer code used for simulation. Reasonable alternative conceptualizations and hypotheses should be developed and evaluated. According to Anderson and Woessner (Applied Groundwater Modeling, Simulation of Flow and Advective Transport, 1992), a conceptual model is a pictorial representation of the groundwater flow system, frequently in the form of a block diagram or a cross section. Its development includes identification of hydrostratigraphic units and system boundaries; assembly of field data including information on the water balance; and data needed to assign values to aquifer parameters and hydrologic stresses. The Peer Review Report contains slightly more detail on the conceptual model than is presented in the ED, but it is not consistent with the standard recommended by Anderson and Woessner.

A10-131

Based on the Peer Review Report, the conceptual model of the Casa Diablo geothermal system is that cold water flows downwards along steeply dipping faults on the western margin of the caldera, gets heated at depth, and flows upwards beneath the Rhyolite Plateau. It then moves laterally towards Casa Diablo to eventually discharge at Hot Creek gorge and the east moat (Figures 5 and 6, Page 8 of the Peer Review Report). The unconformity that separates the Early Rhyolites from the overlying Glacial Till/alluvium units is assumed to present an impermeable barrier between the shallow cold-water aquifer system (west of the Hot Creek gorge) and the underlying geothermal reservoir. The ED and the Peer Review Report do not contain detailed geological cross-sections or supporting hydrogeologic data to support the assumption of hydraulic separation. The supporting hydrogeologic data includes lithology derived from boreholes in the shallow cold-water aquifer system and the underlying geothermal system, and detailed time histories of pressure, chemistry and temperature. But, none of this information pertains to the area of the Basalt Canyon (where the proposed Project's geothermal wells are to be located) and the MCWD production well field. Without such information, the assumptions in the model on hydraulic separation are without scientific support.

A10-131 cont.

The numerical Geothermal Reservoir Simulation Model (GRSM) is built on this conceptual model and assumes, without scientific support, complete separation of the geothermal system from the overlying shallow cold-water aquifer system.

GRSM Calibration. Calibration is the iterative process of adjusting the parameters in the model and/or model hypothesis such as boundary conditions so the model adequately approximates the real ground water system. This is accomplished by comparing the model results to a set of field observations. According to the Peer Review Report, the GRSM was calibrated by (1) matching the pressure monitoring data in some observation wells (SF65-32, SF48-29, CW-3, CD 28-34 and CH-10B), and (2) matching the average temperature of the produced fluids. The calibrated numerical model, according to the report, provides an adequate match to the pressure history in certain observation wells (SF65-32, SF48-29, and CW-3 Figures 17-19, Peer Review Report), and average temperature history for the produced fluids (Figure 20). The Peer Review Report does not provide any figures and tables to show the matches of modeled pressure and measured pressure in the other two other wells used in calibration (CD 28-34 and CH-10B).

A10-132

Figure 1 attached shows the location of two of the five wells used in the GRSM calibration[1] and indicates that three of them are substantially east of Basalt Canyon. Well SF65-32 mainly responds to production from the Casa Diablo area, well SF48-29 mainly responds to injection in the Bishop Tuff beneath the Casa Diablo production area, and CW-3 well is located nearby Fish Hatchery and Hot Creek area. The well CD28-34 is located in the area nearby Fish Hatchery, and CH-10B is located about one mile east of the Hot Creek area. All of these calibration wells are located in the Casa Diablo area and the east discharge area.

[1] The other three wells used in calibration are east of the area covered by the map in Figure 1. There is a text box on the far right of Figure 1 indicating the approximate distance and direction from the eastern edge of the map.

Note that GRSM was not calibrated with any wells located in the proposed Basalt Canyon geothermal expansion area or the area between the proposed Basalt Canyon geothermal expansion area and the MCWD production wells. The Project Proponent has not demonstrated that the GSRM is calibrated in the Basalt Canyon area or areas south and west of the proposed Basalt Canyon geothermal expansion area.

The Peer Review Report did not provide any information on how the GRSM was calibrated, did not reference any sensitivity studies related to the calibrated model parameters and assumptions, and did not provide an assessment that the calibrated model parameters lie within a reasonable range – in fact, the model parameters (hydraulic conductivity, effective porosity, etc.) were never presented or characterized. These are serious omissions for a peer review. The method of calibration and the characterization of goodness of fit between for a series of wells distributed throughout the model domain are a necessary inclusion in model documentation and specifically, for a peer review. They inform the reader how well the model can reproduce the system response to natural and man-made stresses and how well the modeler understands these stresses. A sensitivity analysis should have been presented to show which parameters were the most important to the calibration, the interrelationship of parameters and the robustness of the calibration. And finally, the calibrated model parameters should have been listed along with the reasonable expected range of the parameters to demonstrate that the model was not calibrated to unreasonable parameter values.

A10-132 cont.

Future Model Predictions. The GRSM was used to investigate the response of the geothermal reservoir to expanded production. Two scenarios were considered.

- The first (baseline case) assumes total production and injection to continue without the CD IV expansion at the mid-2011 rates. With the exception of two production wells, all the wells are located in the Casa Diablo area.
- Under the second scenario (CD IV Expansion), both production and injection will be increased from 12,000 gpm to 18,000 gpm – a fifty percent increase. The proposed expansion will be accomplished with four new production wells (assumed to be 34-25, 14-25, 38-25, 26-30) in the Basalt Canyon area, two new injection wells (55-32, 65-32) southeast of Casa Diablo, two new injection wells (12-31, 23-31) between Basalt Canyon and Casa Diablo, and one new injection well (12-25) in the northern part of the Casa Diablo area (Figure 22, Peer review Report). Substantial new production is planned to occur in the Basalt Canyon with the proposed CD IV expansion with unstated and significant amounts of this new production subsequently injected in the Casa Diablo area.

A10-133

All new geothermal production in the CD IV expansion scenario was assumed to occur in the Basalt Canyon area west of Casa Diablo. The Project Proponent estimated the impacts of the CD IV expansion based on the pressure change at wells SF 65-32, SF 48-29, and CW-3 which are not in the Basalt Canyon area or the area between Basalt Canyon and the MCWD production wells:

- Well SF 65-32 is 1.7 miles southeast of Basalt Canyon and about four miles east of the MCWD production wells;
- Well SF 48-29 is 1.7 miles east of Basalt Canyon and about 4.0 miles east of the MCWD production wells; and
- Well CW-3 is 3.4 miles east of Basalt Canyon and about 6.4 miles east of the MCWD production wells.

Note the following:

1. The three wells that were used to estimate the impacts of the CD IV expansion are located in the Casa Diablo area or east of that area – none are located in the proposed Basalt Canyon geothermal well field, the MCWD well field or the area between them. Therefore the Project Proponent has failed to estimate the potential piezometric level declines in the geothermal reservoir in the proposed Basalt Canyon geothermal well field and the potential to draw shallow cold groundwater into the geothermal reservoir and impact the yield of the MCWD well field
2. The projected piezometric levels for the existing and proposed wells in the Basalt Canyon were not presented nor was there reporting of piezometric changes in the geothermal reservoir in the Basalt Canyon area or areas between the Basalt Canyon and the MCWD wells. Even if the Project Proponent had presented the results suggested herein, the Project Proponent has not demonstrated the GRSM is calibrated in the Basalt Canyon area and thus those results are not scientifically defensible.

A10-133 cont.

Peer Review Report Conclusions. The Peer Review Report provides no new information regarding the hydraulic separation of the shallow cold-water aquifer system; and confirms that the model is not even calibrated in the area of the District supply wells and the proposed Project's geothermal wells. Rather, it was calibrated in the area of the existing Casa Diablo well field. Furthermore, the Peer Review Report acknowledges that the review was limited by time and budget to something less than a rigorous review.

A10-134

Mr. Garg concludes: "*The conceptual model forms the basis of a three-dimensional numerical model of the geothermal reservoir. The numerical model was conditioned by matching (1) natural state temperatures and (2) production and injection history (especially observation well pressure histories, mass-averaged temperature history). The good agreement between the model predictions and measurements means that the model may be used to investigate the impact of future production scenarios on the reservoir pressures and temperatures.*"

However, this conclusion is based solely on the matching of piezometric and temperatures in and east of the existing Casa Diablo well field and not in the Basalt Canyon area or areas west and south of Basalt Canyon. The conclusion must be qualified to reflect that the

GRSM prediction abilities apply only to the existing Casa Diablo well field and for historical production rates, and do not have any relevance to what may occur in the Basalt Canyon area. The GSRM predictions for production rates 50 percent greater than historical experience and concerning areas where the model is not calibrated (Basalt Canyon area) are scientifically unreliable to describe the potential impacts of the CD IV expansion on the cold-water system tapped by the MCWD supply wells. A10-134 cont.

Our Conclusions

The operation of 14 new geothermal wells in Basalt Canyon is a completely new stress on the system, and the hydraulic response of this new stress is not accounted for in any of the historical data. The proposed new geothermal wells are closer to the MCWD well field. Given the project description, the ED and the lack of information available for review, the MCWD should be concerned that the operation of proposed new geothermal wells in Basalt Canyon could induce downward flow from the cold groundwater system into the geothermal system, eventually reducing the groundwater yield currently used by the MCWD, and, potentially change the surface water discharge at key locations in the Hot Creek system that could affect the ability of the MCWD to divert surface water in the future. A10-135

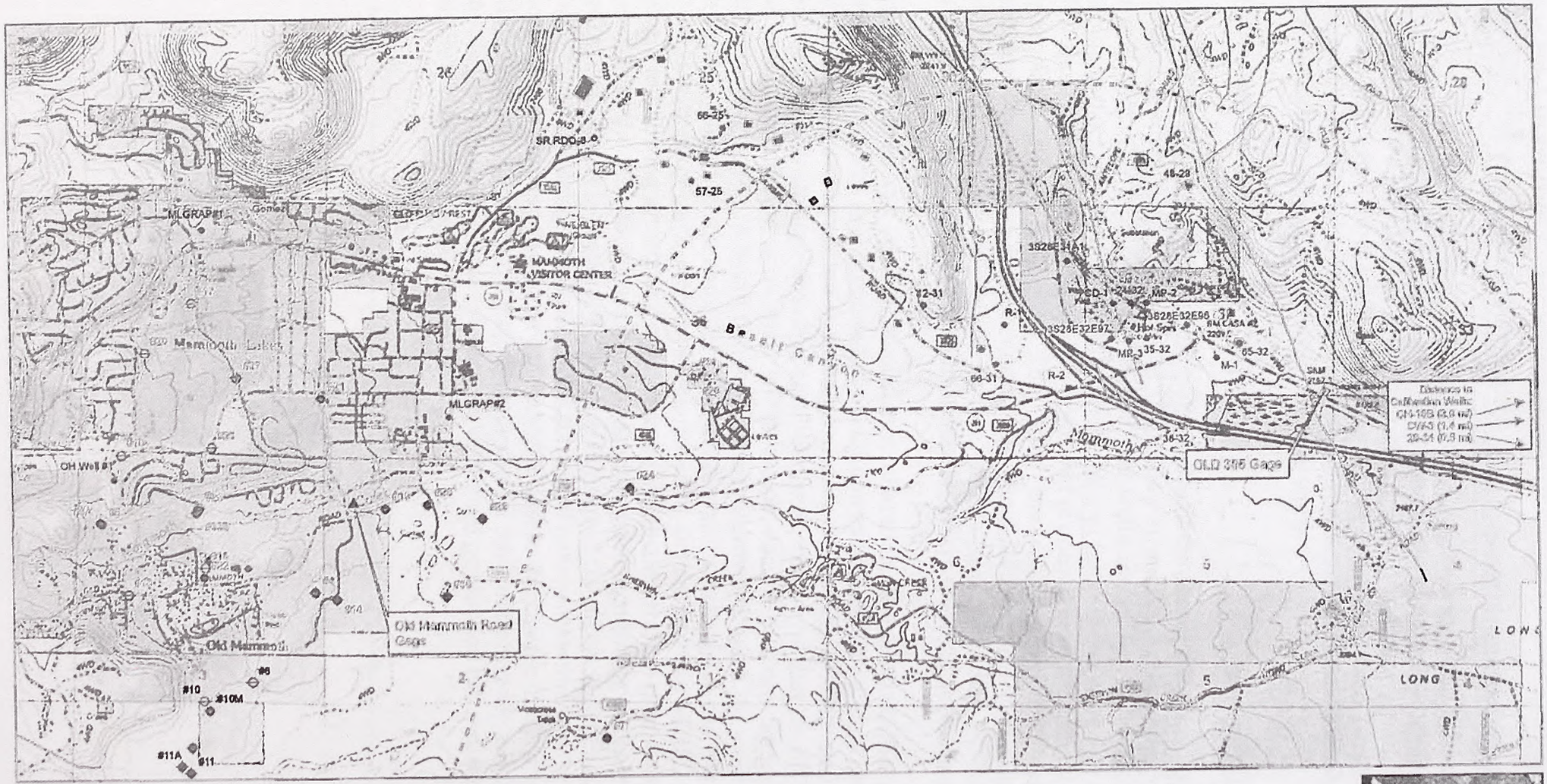
Respectfully, given the paucity of evidence offered in the ED and the supplementary information reviewed and discussed above, the proposed Project should not be approved until the requisite information is revealed and/or developed. If after such occurs and a monitoring program is appropriate at such time, we recommend that the MCWD and Ormat enter into a monitoring agreement which would ensure that any approved expanded geothermal production in Basalt Canyon will not negatively impact the yield of the shallow cold-water aquifer system and alter the surface water discharge in the Hot Creek system. As a requirement of such monitoring agreement, Ormat and the MCWD should jointly develop a monitoring system and a geothermal production startup plan. Ormat would fund and construct the monitoring system and conduct joint monitoring to determine the state of hydraulic isolation in the Basalt Canyon area prior to the production of geothermal fluids and subsequently during production. The startup of new geothermal production should be gradual, and monitoring should be conducted to assess the change in the state of hydraulic isolation. Finally, the monitoring agreement should spell out precisely what Ormat would do should the monitoring results indicate geothermal production has impacted the yield of the shallow cold-water aquifer system. A10-136

We appreciate the opportunity to serve the Mammoth Community Water District on this important and timely project. Please call me or Wenbin Wang if you have any questions or concerns.

Wildermuth Environmental, Inc.

Mark J. Wildermuth, PE
President and Principal Engineer

Wenbin Wang, Ph.D, PG, CHG
Principal Hydrogeologist



WILDERMUTH ENVIRONMENTAL INC.

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Casa Diablo IV Geothermal Development

Proposed Well Sites and Existing MCWD Wells

Figure 1

0 1 Miles

0 1 Kilometers

MCWD Wells
- Monitor
- Production

Basalt Canyon CD IV Expansion Well Site
- Existing Site
- Proposed Site

Geothermal Wells
- Geothermal
- Gradient hole/Core hole
- Abandoned

Faults
- Fault Located
- Fault Approximate

Other Features
- Landslide (EGS)
- MCWD Surface Water Gage
- GR&M Calibration Well

lands leased for geothermal development, and Mono County and LADWP approval, on LADWP and other private land, as applicable, and then implement, a site reclamation plan. The plan would address restoring the surface grades, surface drainage and revegetation of cleared areas as required by USFS, Mono County and LADWP regulations."

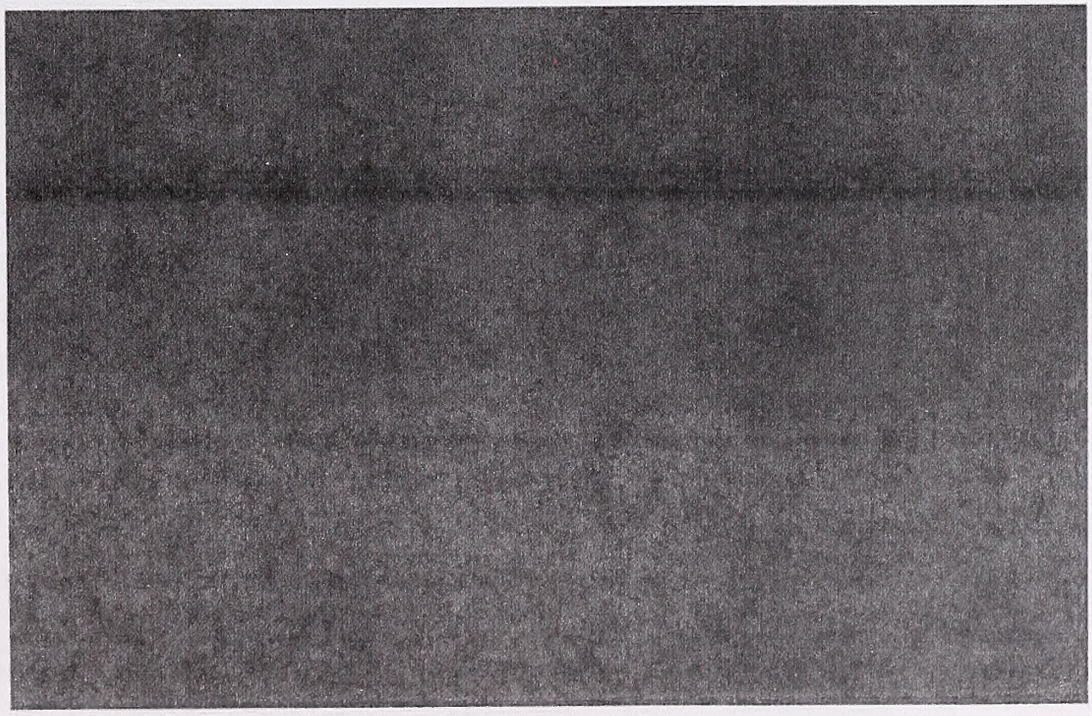
4-9 Comment: Comments made by LADWP on this Environmental Assessment and Draft Environmental Impact Report are not to be construed as formal permission to use the property for this project. If the Alternative Pipeline route is approved and further pursued, you must apply for permission to use LADWP property for this project. If the permission is granted, the terms and conditions of a use agreement (as well as any associated fees) will be established following review of specific design plans.

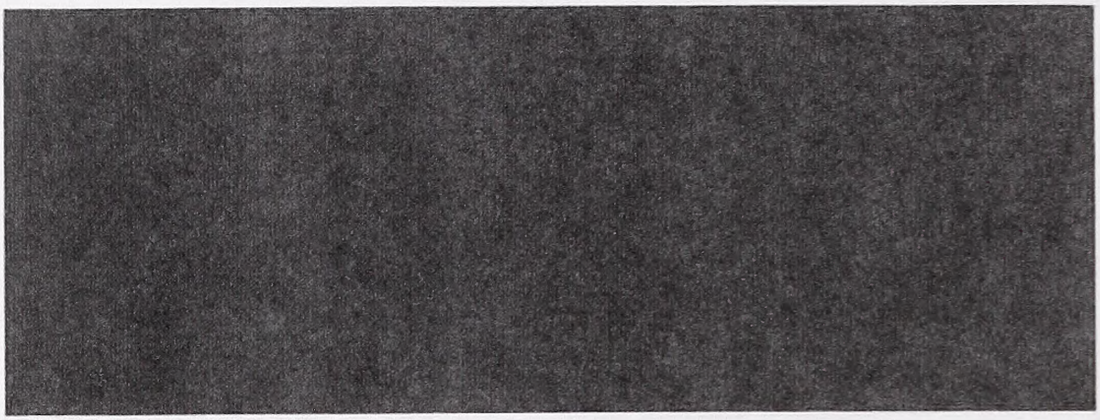
Response: comment noted.

Christopher D. Farrar, U.S. Geological Survey (09/04/2005):

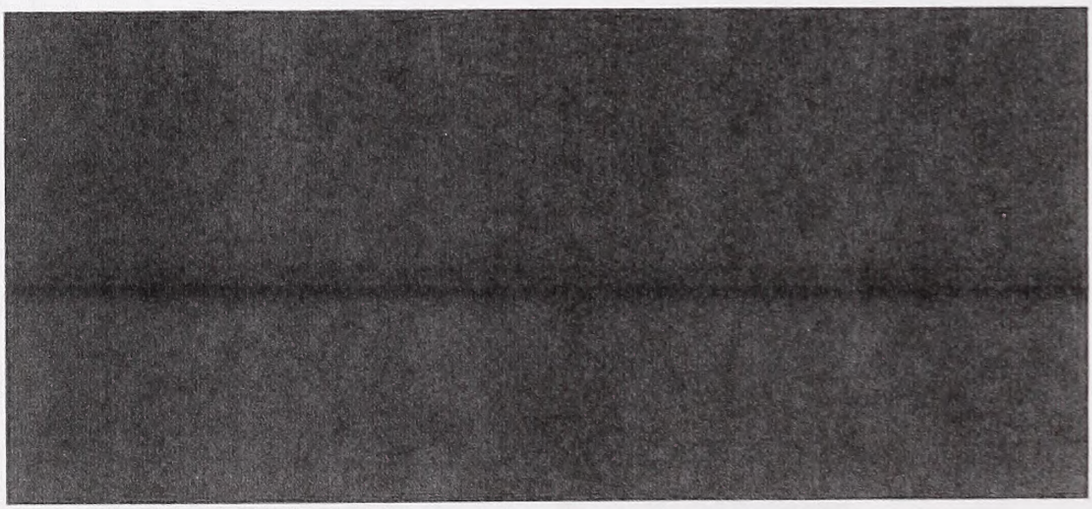
5-1 Comment: There seem to be inconsistencies in the discussion of the model and what it simulates. The document should stress no model is perfect and, at best, models are tools rather than predictors of future conditions (see discussion on p.3 of the summary and p. 3-21, paragraph 2). The project area is located in a part of the region where the model does not match pressure histories very well and so is of limited use in estimating effects to temperatures and pressures caused if the project becomes active. On page 3-21, paragraph 5, it is stated that the model predicts a rise in temperature documented when development began at Casa Diablo, in close proximity to the proposed project area. This point should be clarified or alternatively described as a likely erroneous prediction the model makes. In general throughout the document the model is taken as fact and the physical system is something to be interpreted or described in a way that conforms with the model. In fact the process should go the other way-the model should reflect as accurately as possible what is known about the physical system.

A10-137





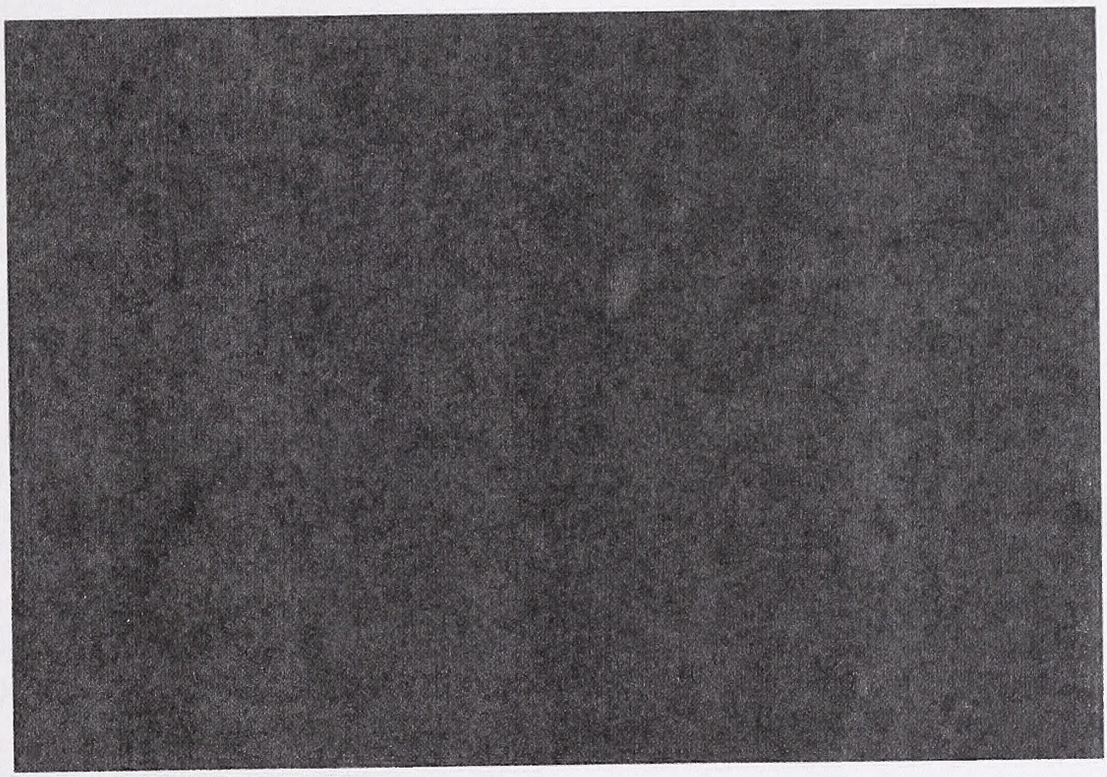
5-2 Comment: Shallow vs deep aquifers or flow systems: Some of this discussion reflects upon the model and what is left out of the model. On page 3, 2 and paragraph, the comment is made that there is no current evidence of a hydraulic connection between the shallow and deep systems (the point is mentioned again on page 3-20, first line). The document should note this does not mean there is no connection, only that information on such a connection in this area is lacking. In fact in parts of the system, near the fish hatchery, it is well known that pressures in the shallow cold ground-water system respond similarly to those in the hydrothermal system. This point is made on page 3-21, 2 and paragraph, where it is also mentioned that the model does not consider the relation. The fact that the model does not simulate the connection between deep and shallow systems indicates it is inadequate to address potential impacts from the proposed project on the potable ground water which the Town of Mammoth Lakes relies upon. A10-138



5-3 Comment: LVHAC monitoring Program: The monitoring program is mentioned in several places throughout the document but it is never clearly stated that the present monitoring program was designed to detect effects from geothermal energy production at Casa Diablo to hydrologic features east of Casa Diablo, not in the area of the proposed project. Very little monitoring data on the hydrothermal system and any possible connections to the shallow potable ground water are available in the project area and the Town of Mammoth Lakes. Therefore the comments on page 3-20, that suggest the LVHAC monitoring data will be reviewed once a year to assure there is no connection between deep and shallow systems are misleading. Instead, the document might suggest the need for additional monitoring A10-139

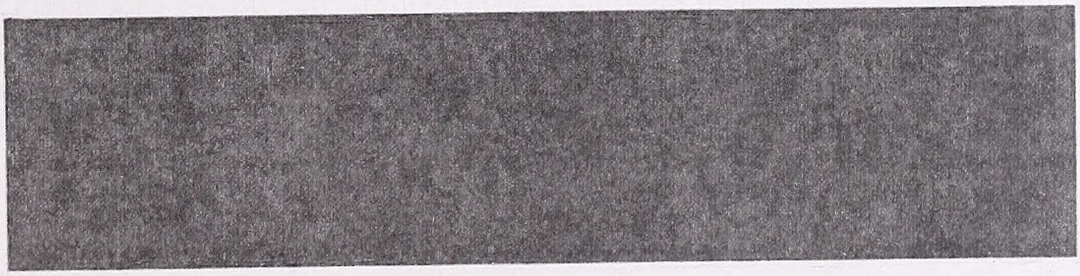
somewhere between the MCWD water supply wells the proposed project area. On page 3-15, the monitoring program is briefly described; this is where an additional statement could be added to explicitly indicate that the current monitoring program was not designed to assess potential changes brought on by climate change (as stated on page 3-15), it was designed, solely, to detect changes in the system caused by resource developments utilizing both thermal and non-thermal waters in the southern part Long Valley Caldera.

A10-139 cont.



5-4 Comment: Quality of thermal waters: On page 3-15, the text suggests that concentrations of Boron, fluoride, and arsenic in the thermal waters are small. The concentrations are small compared to the major ions in the thermal water but are very high when compared to concentrations in most waters that are found at depths of 1000 feet or less throughout the United States. The arsenic value cited is 0.3 mg/l, however analyses are available that show arsenic is commonly found in concentrations of greater than 1 mg/L in thermal waters in Long Valley Caldera. This concentration exceeds drinking water standards by a factor of 100. It would be appropriate for the document to consider the potentially adverse affects that the high concentrations of boron might have on native vegetation if a well blow-out or pipeline break occurred in the proposed project area. Such a discussion might fit in on page 3-17 to 3-18, where geothermal fluid spills are discussed.

A10-140



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Local Agency Formation Commission

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RECEIVED FEB 0 1 2013

Collin Reinhardt
Bureau of Land Management
Bishop Field Office
351 Pacu Lane, Suite 100
Bishop, CA 93514

Attn: Casa Diablo IV Geothermal Development Project

January 30, 2013

Dear Mr. Reinhardt:

Thank you for the opportunity to review the Joint Environmental Impact Statement and Environmental Impact Report for the Casa Diablo IV Geothermal Development Project.

Section 3.13 - Public Safety, Hazardous Materials and Fire, states that the proposed power plant area is within the boundaries of the Long Valley Fire Protection District (LVFPD) and LVFPD would be the first responder to the proposed power plant area. The same section, states that the Mammoth Lakes Fire Protection District (MLFPD) has a mutual aid agreement with the LVFPD to provide assistance if available.

A11-1

Mono LAFCO would like to clarify the district and sphere of influence boundaries and sphere of influence recommendations for each district. The attached map indicates local government boundaries and spheres of influence in the vicinity of the project. The sphere of influence for each fire district is coterminous with the district boundary.

The Mono LAFCO sphere of influence recommendation for each fire district is as follows.

LVFPD:

The Sphere of Influence for the Long Valley Fire Protection District should remain as it is, coterminous with the boundaries of the district. The Long Valley Fire Department sphere includes the area north of Highway 203 and they have no desire to change the scope of their sphere at this time.

A11-2

MLFPD:

The Sphere of Influence for the Mammoth Lakes Fire Protection District should remain as it is, coterminous with the boundaries of the district. LAFCO should study fire protection within the area north of SR 203 and US 395 in order to determine whether sphere of influence and/or district boundaries need to be reorganized in that area. Such a study should occur only with the

A11-3

participation of all affected entities. Any reorganization recommended by LAFCO should occur only with the concurrence of the Board of Directors of all affected entities. A11-3 cont.

In addition, the Town of Mammoth Lakes boundary and sphere of influence share a common sphere of influence with the MLFPD (see attached map). The sphere of influence recommendation for the TOML specifies: A11-4

The Town's Sphere of Influence should remain coterminous with the Town boundaries, including the area owned by the Town at Mammoth Yosemite Airport. The Town has established an Urban Growth Boundary within the Town Boundary; development is limited to the area within the Urban Growth Boundary. There is no demonstrated need at this time for additional land for urbanization. The current and proposed Town of Mammoth Lakes Sphere of Influence complies with local LAFCO goals for establishing spheres of influence that focus on providing orderly, planned growth and preserving open space. A11-5

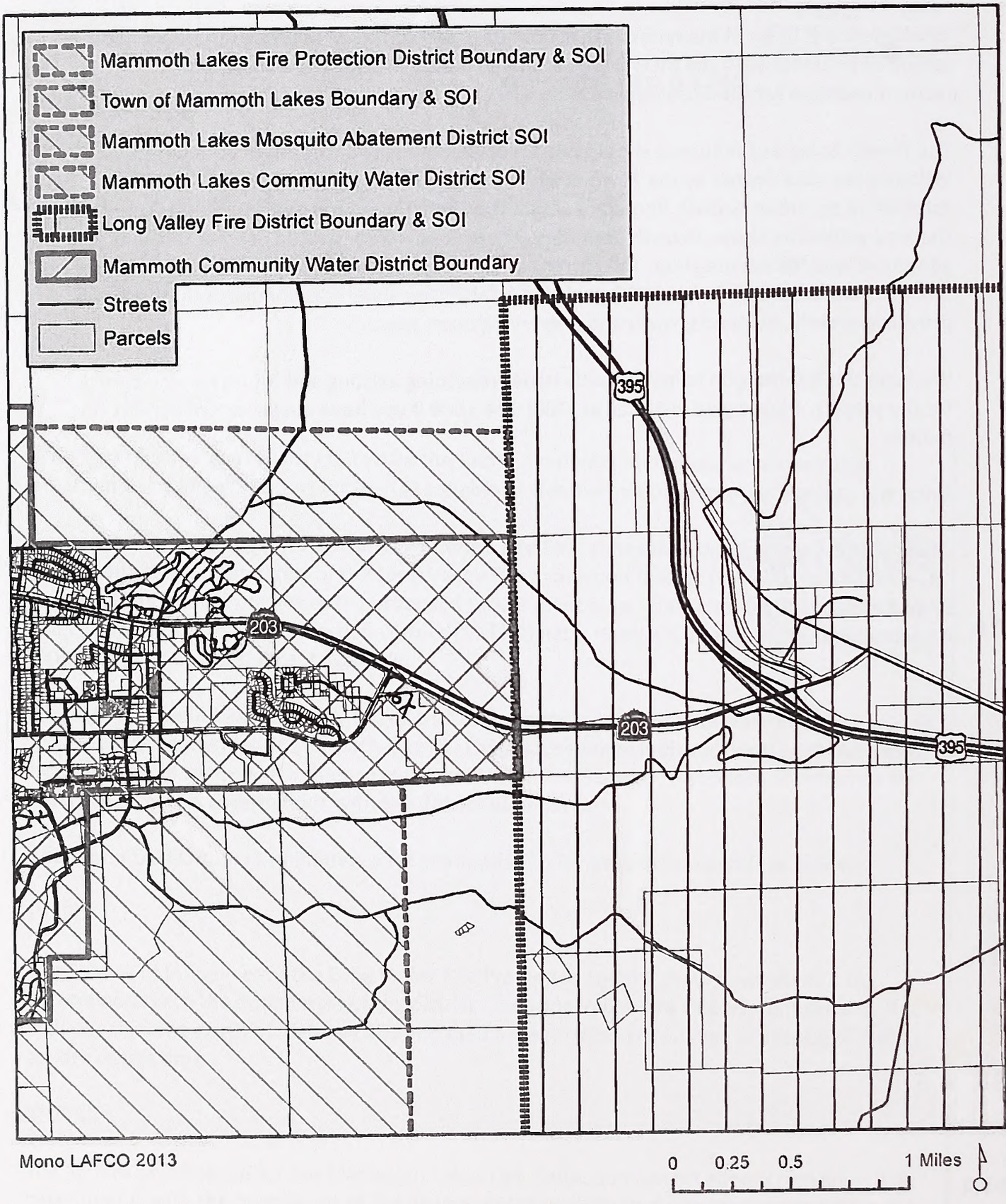
We hope this information helps to clarify issues regarding existing and future service providers for the project. Please give me a call at (760) 924-1809 if you have questions concerning this matter.

Sincerely,

Brent Calloway
Associate Analyst

Cc Mono LAFCO

Local Government Boundaries and Spheres of Influence (SOI) in Casa Diablo Geothermal Project Vicinity



A11-

Kupferman, Steven A <skupferm@blm.gov>

11/19/12

to Steven, me, James, Sara

Steve and Collin...I am forwarding this email, below, that came in to the

SO Public Room....

Thanks...Steve

Steve Kupferman

Branch Chief, Energy and Minerals

Bureau of Land Management

California State Office

2800 Cottage Way

Sacramento, CA 95825

916-978-4383

916-978-4388 (fax)

916-335-5389 (cell)

-----Original Message-----

From: BLM_CA_SO_Public_Room

Sent: Monday, November 19, 2012 5:39 AM

To: Kupferman, Steven A

Subject: FW: homepage feedback

fyi

-----Original Message-----

From: jnmatplay@yahoo.com [mailto:jnmatplay@yahoo.com]

Sent: Sunday, November 18, 2012 5:15 PM

To: BLM_CA_SO_Public_Room; Mary Lou West

Subject: homepage feedback

name = John Marinkovich

organization =

email = jnmatplay@yahoo.com

subject = Casa Diablo IV Geothermal Project FeedbackType = Comment

request_comment = I am in support of the Casa Diablo IV Geothermal Development Project. I considered Geothermal one of the best alternatives to Fossil Fuel powered plants and second only to Hydro Power. All electrical power plants will occupy land and have some impact on area it occupies, but so does a home, the BLM offices and the roads we use to go to the grocery store or work. Geothermal uses the smallest footprint in relation to the power it can produces, it is also a on-demand energy source due to the natural heat source that is the center of the earth, and emissions sources are minimal, which only Hydro can say the same. Solar and Wind are dependent on the weather, therefore not on demand. Some people my say I can go off grid, but what about Hospitals, Markets with



I1-1

refrigeration, and places of work. Most of our economy needs dependable power. Geothermal is large part to getting off oil, the BLM and any other governmental agency should doing all they can to support more Geothermal.



I1-1 cont'd

username123 =

sentinal = Sentinal

page_referred_from =

http://www.blm.gov/pgdata/content/ca/en/prog/energy/fasttrack/casadiablo.html

fo = 0

Submit = Send Request

January 15, 2013

Collin Reinhardt, Project Manager
Bureau of Land Management
Bishop Field Office
351 Pacu Lane, Suite 100
Bishop, CA 93514

Attn: Casa Diablo IV Geothermal Development Project Draft EIS/EIR

Dear Mr. Reinhardt:

The introduction to this Draft EIS/EIR states that "the lessee must show that the proposed activity or development can take place without significantly affecting USFS management objectives for the land in question" in accordance with Bureau of Land Management regulations. As written, this draft falls short of demonstrating this basic tenet of maintaining Forest Service Lands open to use by all citizens. **I2-1**

My comments are as follows:

Recreation:

This draft understates the impacts to winter recreation in this area. I have cross country skied this area for years. The draft presumes that all activities happen along the designated groomed trails in this area, which is incorrect. The basic definition of cross-country skiing is "skiing across the countryside over flat land and small hills." Recreational opportunities will be lost, without adequate analysis of the following: **I2-2**

- The three to four pipelines and the plowed road will be an impenetrable barrier to skiing in this area. The widths of pipelines are not stated or evaluated in this draft, nor is there consideration for additional crossings other than the few system roads selected for all recreational transit across the pipelines. This analysis is critical to determining the full impacts. **I2-3**

- There is no estimate of acres lost to recreation due to the additional pipelines. Essentially, the area from the Ranger District Office north and east is seriously impacted but this is ignored in the draft. Please provide this information and the analysis used to determine impacts. **I2-4**

- There is also no definition of the impact that the deer migration mitigations as shown in Figure 4.4-5 will have on recreation. There is also no discussion of how these areas will be engineered. Please provide this information. **I2-5**

Please provide user statistics related to winter use, quantify the acreage lost, and provide adequate mitigations for the losses. Please provide additional crossings to mitigate the barriers to skiers as well as realistic mitigations for those areas where the pipes remain above ground. I2-6

The draft further concludes that simply placing signs near the pipelines is adequate mitigation for the fact that snowmobiles will also be traveling across the open areas, not just on groomed trails, and will come upon pipelines suddenly. It is foolish to presume that simple signage will avert collisions with the pipelines. Please provide adequate mitigations I2-7

Finally, I am a frequent user of Shady Rest Park during the summer months. There is no analysis of the impacts on any summer activities in this draft. Please provide user statistics and analysis of the impacts as well as adequate mitigations. I2-8

Noise:

The noise impacts of multiple operating wells on the Shady Rest area are not properly analyzed. Cross-country skiers moving through this area will not quickly pass the well heads and no longer be aware of the noise as is stated in the draft.

Also, the presumption that only noisy activities are carried out at Shady Rest Park and the close-by campgrounds ignores the reasons why people choose to recreate in these areas. No one will want to camp near the cumulative noise impacts of multiple wells nor will they wish to have a quiet picnic in similar surroundings.

Please expand the noise analysis to reflect actual increases in noise levels and realistic mitigations, such as enclosing the well heads/pumps in noise reducing structures. I2-9

Economic Impacts:

The draft asserts economic benefits based on a Wahlstrom & Associates Study (2012), yet this study is not available for review and analysis. Please provide the study and show how the conclusion of millions of dollars in benefits was calculated. I2-10

In closing, this draft purports that the non-renewable resources have been protected. However, the one non-renewal resource we will lose is the recreational opportunities. This project will degrade the trails and campgrounds to the point where they will cease to be considered an amenity. I2-11

Sincerely,

Jo Bacon
PO Box 100 PMB 134
Mammoth Lakes, Ca 93546

Email cc: Great Basin Unified Air Quality Control District

To: Collin Reinhardt, Project Manager
Bureau of Land Management
351 Pacu Lane Suite 100
Bishop, CA 93514

January 16, 2013

From: Jim Paulus, Principal
Jim Paulus Ph.D.
PO Box 1605
Mammoth Lakes, CA 93546

RE: Comments regarding November 16 Draft EIR/EIS for the proposed CD4 Project

I am writing to comment on three areas of the November 16, 2012 Draft EIR/EIS for the CD4 Project, regarding general themes that are found mainly within the biological analyses portions of the document. I am seeking clarification to proposed provisions for wildlife movement, methodology that will be employed to monitor biological resource response to project implementation, and the treatment of wetlands and other aquatic resources that occur within the area of the proposed project. My comments do not indicate support or otherwise for the project, but arise from my experience within the project area as principal biologist in the field, from having the privilege to perform the biological surveys and deer movement surveys referenced in the document, having conducted biological resource monitoring under the supervision of local U.S. Forest Service personnel, and having done the native revegetation work for previous geothermal installations under contract to Ormat and their predecessors. I believe the body of work compiled during the last 12 years at this site should be considered fully in order to achieve the best possible project, and the purpose of these comments is to point out where additional consideration would seem to be warranted.

I3-1

1. Wildlife Movement

On page 4.4-7 the analysis concludes that "pipelines would be a physical obstruction that could impede wildlife movement". This potentially includes deer movements to water or during migration, as was hypothesized by local CDFW and USFS biologists during the development of deer survey protocols for the project. The analysis then states on page 4.4-28 that pipelines will "create a wildlife movement barrier that will alter but not likely impede the movement of mule deer and other highly mobile species" in apparent contradiction. With due regard to the existing deer movement data that has been collected at the site of the proposed project and the existing Basalt Canyon Pipeline during summer residency and fall migration in 2011, the latter conclusion could indeed seem justified for installation of *single* aboveground pipeline. But the project proposes to create several miles of *double* or even *triple* pipeline barrier. Scant data we have available for double pipeline indicates it is avoided by deer (as opposed to single pipeline, which caused no detectable redirection of movements). These data were requested and are presumably part of the record, so they must be considered. Double pipeline's potential to 1) redirect or restrict the nightly movement to water of resident deer including fawns, 2) erect restrictive linear barriers across traditional deer migration routes, and 3) reduce habitat quality for deer due to lost access to water should be more clearly stated. The analysis would be strengthened if it is explained how the project's pipelines as proposed will have an impact on every movement corridor that was identified in 2011. The contention

I3-2

on page 4.4-17 that Project Design Measures BIO-1 and VEG-1, with Mitigation Measures VEG-1, WIL4, WIL-5, and WIL-6, will reduce adverse impact on movement can then be more fairly weighed. I3-2 cont'd

It is concluded that deer movements may be affected by the increase in noise, lighting, and traffic during construction (4.4-6 paragraph 2) and during operations (4.4-17 paragraph 3). This construction is scheduled to occur during the normal period of spring migration for 2-3 years. Furthermore, impacts to mule deer (and other sensitive wildlife) also could occur if there are construction and operations-related increases in unleashed dogs and predators, an issue that was established by recent precedent in analysis for the M-1 Replacement Power Plant Project. But the potential for increases in noise, lighting and traffic to thwart deer movement is mentioned only in passing. There are no follow-up discussions of potential impacts from increased noise, lighting, traffic, trash, dogs, or predators (the latter two are not mentioned in the document, I believe). While the Traffic Project Design Measure (PDM) TR-7 and Mitigation Measures AQ-2, and REC-1 mandate 15 or 25 mph speed limits for various reasons, potential wildlife issues are not addressed, and no discussion of likely wildlife response to increased traffic was found. Similarly, "trash would be routinely collected" (page 4.17-4 paragraph 4) is the only statement about trash that I found. Predators could be attracted to the CD4 Project if the availability of human food and trash is increased. The only operations lighting discussion I can find is focused on potential impacts to visual resources (page 4.18-16). A statement on page 4.4-6 that "Excessive noise would be controlled through implementation of PDM's NOI-1 and NOI-2" (construction equipment mufflers, avoidance of doing construction loudly) is the only treatment of potential effects on wildlife that is given. None of these issues are new to geothermal development in the area, as they were all discussed in terms of what can be concluded regarding mule deer (resident and fall migrant) use in the recent EIR for the M-1 Project at Casa Diablo. Mitigation measures such as shielded facility lighting, covers or exclusion fences at trash receptacles, or leashing for employee dogs, if needed, could be modeled after the measures offered for the recently certified M-1 Project, as all of these were addressed there with apparent adequacy. I3-3

Statements that noise levels during operations will be the same as they were pre-project (for example, page 4.4-19) are likely in error, because the proposed wells and the power plant will generate new noise. The potential impacts of constant pump and power plant operations noise upon wildlife use and upon resident and migratory deer use in particular should be more fully discussed. Of most interest will be the new noise sources nearest where the 2011 data show concentrated resident or migratory deer use and movement of fawns to water. I3-4

The statement on page 4.4-17 paragraph 3 "It is estimated that up to 100 migrating deer could be redirected" is misleading because it inflates a fall 2011 *M-1 Project* area use estimate of 100 migrants to falsely represent a potential effect that could occur within the larger *CD-4 Project* area during fall and spring migrations. The M-1 data set represents only a small fraction of the CD4 area and estimated deer use during fall residency and migration. Likewise, the reference to the M-1 project area deer use estimate (Paulus, 2012a) cited in support of the contention on page 4.4-17 (last sentence) that impacts to deer at CD4 will be insignificant should be replaced. The entire CD4 project area data set, which is much larger and more relevant to the question at hand, and which is referenced elsewhere in the document, would be the proper basis for formulating conclusions about how deer will respond. I3-5

Delete or edit the statement that Paulus (2011b) concluded fawns require 16 inches clearance to pass under a pipeline (page 4.4-8) because this conclusion is never made, nor is any other "minimum I3-6

clearance" hypothesized or identified. This mis-quote cannot be used to justify a conclusion that fawns will not be obstructed by the pipeline. I3-6 cont'd

It would be helpful to disclose the reasoning used to arrive at the conclusion that loss of 36.24-36.86 acres of forest and 38.96-39.56 acres of scrub habitat (Table 4.3-2) will not have substantial impact upon deer foraging, fawn rearing, and movement due to habitat loss or fragmentation. The locations of some of these habitat losses overlap or potentially could isolate areas where relatively high deer use was documented in 2011. I3-7

The discussion on page 4.4-16 that implies that all migrating deer pass through the existing Casa Diablo complex is less than convincing in support of the overall discussion of potential impacts to deer. A somewhat similar, very confusing error is included in the wording of Mitigation Measure (MM) WIL-5, where Monteith's (2009) radiocollar trackpath data (Fig. 4.4-1) are referenced as "traditional migratory routes" when in fact the trackpaths depict where a few marked individuals once traveled. These passages should instead reference the much larger deer track data set that was collected throughout the project area in 2011 (e.g., Fig. 4.4-5 is an interpretation of these more relevant data), in order to give a more accurate depiction of where deer use occurs in the project area. I3-8

Figure 4.4-5 should now be edited for the context of MM WIL-5. For completeness, the actual locations for all known pipeline gaps/crossings are needed. Remove "suggested" from the caption. Also remove pipeline spreading arrows, as no design feature of this type for wildlife passage is proposed. As written, the locations and number of pipeline crossings seem to vary throughout the analysis. Compare, for example, the statements at page 4.4-17 (top of page), Figs. 4.4-2 through 4.4-4 (which specifically call out 30-31 crossings, all at roads), and the called-for MM WIL-4 and WIL-5 crossings that are not shown in any figure or mentioned in the project description. Vertical expansion loops are offered as passages for deer on page 4.4-16, but then taken away with MM VIS-2c. The current treatment is confusing. It would help if the text is consistent with regard to where each known wildlife passage is proposed to be installed (Figure 4.4-5 presents the best opportunity for these locations to be shown). If there are locations that will be determined when pipeline design is finalized, please state this clearly. Also, clarify the mechanism by which called-for (but not yet sited) crossing locations will be determined. One way would be to reference the cited deer studies, which in 2011distinguished between those areas that were relatively highly used by deer and areas such as Upper Basalt that were not. If mitigation is needed, then a measure that requires planning in consultation with the project biologist/monitor would help ensure effectiveness. I find it curious that the numerous horizontal expansion loops proposed on page 2-29 are not characterized where possible as corridors where the double or triple pipeline configuration changes to single pipelines that are more widely spaced and may be readily leaped by deer. I3-9

The overhead crossing described as south of Hwy 395 in the text of MM WIL-5 actually will be constructed north of Hwy 395 as I understand it. This span will avoid both the high-use deer movement corridor and the potentially jurisdictional wetland habitat that occurs there, an important beneficial design feature that is lost as written but should be clearly described (see also wetland comments, below).

2. Vegetation Monitoring

Botanical baseline surveys have been performed across the entire project extent. This includes several areas that were surveyed or resurveyed in response to project footprint revisions proposed in 2012. I3-10

The reported results of these surveys are cited in the DEIR/EIS. To maintain consistency, Table 3.3-1 should be revised by 1) replacing citations of Paulus (2002) with citations of the relevant resurvey work done in 2010 and 2012, and 2) removing all references of "studies to be conducted", as surveys of these areas were done in 2012. Additionally, the statement on page 3.3-1 that botanical surveys for .77 miles of new roads will be conducted in the spring and summer of 2013 could be revised, as all these areas had been surveyed or were resurveyed in 2012.

I3-10 cont'd

The calculation that "30% of the new pipeline corridor will be permanently devegetated" due to piers and footings as given on page 2-30 seems highly over-stated. Devegetation that is attributable to the project and scheduled to be restored after decommissioning is elsewhere referred to as "temporary" rather than "permanent" (the first sentence on page 4.3-2 provides such a definition, but see page 4.3-5 where the document reverts to confusion in use of terms). To better facilitate PDM and MM implementation, and improve clarity throughout the document, use of "temporary" and "permanent" must be consistent wherever they are used to qualify disturbance-related impacts. Regarding geometry, I do not find the dimensions of footings to be stated or shown in the project description, but cannot imagine how 30% of the 40 ft wide corridor will be covered by concrete.

I3-11

Multi-agency approval for revegetation and monitoring of biological resources goes against precedent for successful outcomes that have been enjoyed for many years in the project area. In the case of the CD4 Project, it may cause the introduction of unusual or unrealistic goals/methods, may delay the approval process for methods and inputs so as to miss critical seasonal timing for seed spreading and tree planting, and will confound the issue of sheep incursion into revegetation areas. Given that USFS is the managing agency for surface lands while BLM is the managing agency for the subsurface mineral estate, then it would seem that revegetation and biological resource monitoring are not the BLM's concern. For the sake of efficiency and precedent, consider replacing the Mitigation Measure VEG-2 requirement that the Weed Management Plan must be approved by both the USFS and BLM with "the Weed Management Plan will not be implemented until it is approved by an Inyo NF botanist who is familiar with the project environment." Add to MM VEG-1 the statement "the Revegetation Plan will not be implemented until it is approved by an Inyo NF botanist who is familiar with the project environment."

I3-12

In order to be effective, Project Design Measures BIO-6, BIO-7 and BIO-8, and Mitigation Measure VEG-2 must all distinguish "post-construction" from "post-revegetation" and "post-project" when stating firmly the point(s) at which weed monitoring, reporting and remediation clocks are being started. Clarify whether PDM BIO-6, a measure which invokes MM VEG-2, requires monitoring, etc., for 3 or for 30 years. PDM BIO-7 disagrees with MM VEG-2. Where the former would start monitoring "following completion of revegetation measures", MM VEG-2 requires monitoring and meeting of goals beginning with construction and for the lifetime of the project (VEG-2.3 "Monitoring"), but confuses the timetable by later stating that monitoring is required for only the first three years of operations (VEG-2.5 "Success Criteria"). Adding to the uncertainty regarding whether these measures will effectively meet the stated goals of weed control, the authors fail to recognize that MM VEG-2 Plan submission and approval must be done as a series of plans and timetables due to the phased schedule for Project implementation. At a more basic level, the texts of PDMs, which are presented in multiple, must match exactly wherever they appear. Edit BIO PDM's where they differ (for example, PDM BIO-7 as presented on pages 4.3-3 and 4.4-3).

I3-13

The effectiveness that may be reasonably expected of Mitigation Measure VEG-2 could be strengthened by the addition of critical details of how the monitoring data will be used to trigger weed controls. The "stratified random sample" method required for weed identification and for assessment of abundance pursuant to VEG-2.3 goals for reporting could be elaborated to identify what are the strata. The central question, "have measurable and visually verifiable increases occurred?" is reasonable, but it is better to identify the triggers now and with the greatest precision possible by specifying sample details, statistical treatment(s), quantifiable thresholds for significance, and end points for remediations, so that the Weed Plan's basis is clearly delimited for and understood by the readers and the responsible agencies who will be interpreting the monitoring results for the next 30 years. Consider also adding to the trigger definition "measurable and visually verifiable increases" the qualifier "that span two or more consecutive years of monitoring results collected at the end of the growing season". As written, the threshold of the trigger is too sensitive to be ecologically reasonable. **I3-14**

The statement in the text of Mitigation Measure VEG-2.3 that the period November to April is the early growing season should be revised. The early growing season for weedy annuals is February or March in the warmest zones of the thermally disturbed habitat, including some areas to be disturbed by pipeline installation. Identification of weeds "prior to seed set" in Jeffrey Pine Forest and Big Sagebrush Scrub should be scheduled for the optimal window May to June. The reference to USFWS in MM VEG-2.4 is likely a typo. **I3-15**

Please clarify the confusing wording on page 3.3-6 (top of page) that gives an impression that past revegetation at Basalt Canyon occurred spontaneously. While some of the revegetation there was undoubtedly naturally occurring, the discussion should instead strive to relate how revegetation methods that were implemented in the past in forest and scrub at Basalt Canyon, Upper Basalt, and Casa Diablo have resulted in successful, relatively rapid native vegetation establishment. These efforts have met the prescribed mitigation goals that will ultimately return the area to pre-project conditions, a good track record that is never pointed out in the DEIR/EIS. **I3-16**

The analysis fails to include the incompatibility of sheep grazing and revegetation requirements, which has been thoroughly documented in correspondence with the Inyo NF during recent well pad and pipeline revegetation work at Basalt Canyon and Upper Basalt. If this practical experience is included, it would be reasonable to conclude that sheep must be excluded until revegetation goal attainment has been certified by the Inyo NF. If this conclusion is not reached, then add to <u>all</u> the revegetation goals stated in Project Design Measures and Mitigation Measures the qualifier "…unless the project botanist documents use of the area by grazing sheep during the growing season in which monitoring data are collected. In any year the project area of effect was used for sheep grazing, monitoring data collected during that year for annual reporting shall be assumed to indicate (pre-grazing) conformance with required revegetation progress." Furthermore, add "Data that has been collected in order to document weed abundance will be disregarded in all years when the project area has been used for grazing". As an alternative to the above changes, it would seem reasonable to remove the incompatible uses as proposed, by revising DEIR/EIS mitigations to include: "In all years when revegetation monitoring is prescribed at Basalt Canyon and Upper Basalt, the District Ranger who is responsible for issuing the annual operating instructions for the Sherman/Deadman Sheep and Goat Allotment will include instruction that the project area and associated bed areas are to be avoided by sheep herders during that year". Experience at this site has proven that it is not reasonable to expect successful revegetation or weed control in the face of current sheep use patterns. **I3-17**

Finally, inconsistency in use of place names and plant community names could cause confusion among DEIR/EIS readers. The project area lying west of Hwy 395 is referred to as "Basalt Canyon", "Upper Basalt and Basalt Canyon", and "Upper Basalt Canyon" variously in the project description (see for example page 2-8, where well pads located in "Upper Basalt Canyon" have moved to "Basalt Canyon" in the following paragraph.) "Upper Basalt" as a term was used during the permitting process for certain geothermal exploration projects. It refers to the area that is north and immediately east of Shady Rest Park. The boundary between Basalt Canyon and Upper Basalt was retained within the technical reports cited for the CD4 Project. It is not clear if Upper Basalt still exists (see Figure 3.8-2) or has been absorbed into Basalt Canyon for this analysis. A figure could be added to the project description for clarity, and then the document edited for usage (especially, Tables 2.1 and 2.2). If the term Upper Basalt is obsolete, it would be helpful to explain that DEIR/EIS usage of "Basalt Canyon" includes areas that have been previously recognized as "Upper Basalt". Adopt a consistent name for the sagebrush scrub community. "Sagebrush Scrub" appears to be most popular, but "Great Basin Mixed Scrub" is common in the wildlife section. According to the community classification that is cited in the DEIR/EIS, "Big Sagebrush Scrub" is the correct name. I3-18

3. Surface Hydrology

There is inconsistency in how the surface hydrology resources are treated in the analysis. The 2012 "blue line study" (Paulus, 2012) is cited, but information included in the DEIR/EIS analysis is in places contradictory to conclusions of the technical report. Perhaps most importantly, wetland meadow communities that are considered sensitive by the State of California and may be subject to Clean Water Act planning and permitting occur within the project area, yet the DEIR/EIS denies their existence at crucial points in the analysis. The demonstration of avoidance is not transparent because of this. I was informed during pre-project meetings that the project design includes 100% avoidance of the small areas that potentially qualify as wetlands under the jurisdiction of USACOE or CDFW. Unless the mechanisms for avoidance are clarified, the document's conclusions regarding the presence/absence of resources (for example, the statement on page 3.4-3 that no surface waters, springs, etc. are available as habitat for wildlife), and regarding the need for permits from agencies such as CDFW (page 1-14), and regarding the need for demonstration of avoidance, will appear to be unsupported by the information that was available (and cited) at the time preparation. Showing wetland extent in some standard planning format would be helpful. Avoidance could perhaps be clearly demonstrated with a set of figures showing how pipelines in the Casa Diablo area span potentially jurisdictional areas (no figure depicting the extents of this resource are provided in the current draft). Within the analysis presented in Chapters 4-5, site-specific mitigation such as increased pipeline span distance at each intersection, and protection from construction erosion and trampling could be added as appropriate. I3-19

It is stated variously that the project area drains to Mammoth Creek (pages 3.3-2 "washes and swales drain the Project area, eventually flowing to Mammoth Creek", and 3.4-2 "unnamed ephemeral channels drain the Project area, eventually flowing to Mammoth Creek"), or that portions of it do not (for example, page 4.19-3 and Figure 3.19-1). For clarity, the extents of aquatic resources should be presented consistently and in agreement with the technical study's conclusions regarding where riparian, riverine, and tributary type resources exist at USGS-designated blue lines and where they do not. The conclusion that all Riparian Conservation Area (RCA) designations will be avoided by proposed pipelines and access roads is somehow reached on page 4.3-8, even though the extent of blue lines, the area of current RCA I3-20

designation, and the intersections of project roads, well pads and pipelines with areas of actual resource meeting RCA or wetland definitions are never presented as foundations for such a conclusion. A map that is similar to Figure 3.19-1, if augmented with RCA and wetlands depictions, and if the re-labeling of USGS-designated blue lines as "historic channels" is explained, would provide a more complete basis for later conclusions regarding avoidance. The contradiction of the statement that RCA's are to be avoided "to the extent possible" (text of MM HYD-2) with the later interpretation that MM HYD-2 requires pipelines and access roads to be located outside RCA's (page 4.3-8 paragraph 2) can then be addressed.

I3-20

The cited 2012 "blue line study" documented that riparian biological resources do not occur in the CD4 Project area west of Hwy 395. But project pipelines and roads are sited within RCA corridors as currently designated west of Highway 395. If the MM HYD-2 implication that all pipelines and roads have been sited outside RCA's "as delineated by USFS" is intended to release this area from the inclusive designations given in the most recent Forest Plan Amendment, then this redesignation should be clarified. A figure could be added to support the seemingly proffered (if not clearly stated – see pages 3.3-11 and 3.3-18) conclusion that these corridors are not subject to Mitigation Measure HYD-2 siting restrictions. As written, it is not clear where HYD-2 would apply, or whether RCA's will be avoided generally or selectively. If the intent is to avoid impacts to riparian biological resources more specifically, as opposed to more widely avoiding the 300 ft width of the designated RCA corridors, then HYD-2 should simply be reworded to avoid any mapped vegetation communities that are considered riparian in nature.

I3-21

Several factual errors are apparent regarding the sensitive meadow communities and potentially jurisdictional area at Casa Diablo. Errors that would serve to marginalize this resource in the project area must be corrected if the full extents or range of potential impacts of the project are to be identified. The statement on page 3.3-18 (first sentence) that wetlands were not mapped as a separate plant community should be deleted. This description is attributed in error to the 2012 delineation. In fact, this is taken from a 2002 botanical survey report. Revising Table 3.4-1 to reflect that riparian meadow and seasonal aquatic habitats are present would enhance accuracy. All depictions of the drainage channel in the Casa Diablo area as "intermittent" (e.g., page 3.19-1, Figure 3.19-1) should be revised. This feature was delineated in 2012 as a continuous wetland and non-wetland tributary channel throughout its intersection with the proposed project, i.e., between the northernmost pipeline crossing and the retention basin south of Old Hwy 395. Furthermore, two second order non-wetland channels and four seasonal springs were mapped in the area in 2012. The tributary position of this reach relative to Mammoth Creek and the role of the existing retention basin should be clarified. Statement that habitats associated with surface waters do not exist in the project area (for example, page 3.4-3) should be revised to reflect the fact that riparian meadow and seasonal aquatic riparian and spring habitats are present. It would be appropriate to add reasoning why the potentially jurisdictional area at Casa Diablo does not qualify as a USFS "Special Aquatic Area" as defined in the 2004 SNFPA, and why a wider (600 ft) RCA corridor designation is not proper there.

I3-22

I remain at your service, should any of these comments need further clarification. Also, if any questions regarding the technical studies in support of the biological resources analyses come up in the future, please feel free to call or write.

Sincerely,

Jim Paulus, Ph.D.

1-24-2013

Brigitte H. Berman
PO Box 8754
Mammoth Lakes, Ca. 93546

RECEIVED JAN 2 5 2013

Collin Reinhardt
Bureau of Land Management
Bishop Field Office
351 Pacu Lane, Suite 100
Bishop, CA 93514

Attn: Casa Diablo IV Geothermal Development Project

Dear Mr. Reinhardt:

Thank you for extending the review period for comments regarding the Join Draft Environmental Impact Statement/Environmental Report (EIS/EIR) for the Casa Diablo IV Geothermal Development Project.

I have the following comments, which I have not noted in any submitted reviews.

B. Environmental Consequences

1. Air Quality
Section 4.2.4.2a) concludes that the project would not conflict with the Town of Mammoth Lakes Air Quality Management Plan.
However: Geothermal sources emit gases in particular: Hydrogen Sulfide, Carbon Dioxide and Methane.
The USGS observation well (RD8) was located a few hundred feet to the north west from the Shady Rest Recreation Area. The well had been enclosed by a wooden structure. Soon after, the well was abandoned because the gas emissions were considered too dangerous.

I4-1

The new Geothermal wells are located north of this well and higher structurally than the recreation soccer fields.

My question is: Are the gases that are inherent with geothermal activity being captured at the well head or are they vented?
With increased geothermal hot water or steam production in the area the emitted gases which are heavier than air will accumulate over the recreational fields since these are structurally lower than the new wells.

This is a very undesirable health problem. A recreational sports facility for children should not be located in the middle of an industrial geothermal complex. Since geothermal energy is a very highly promoted source of electricity, it should be considered to move the Shady Rest Recreational facility to a environmentally saver location.

I4-2

Brigitte H. Berman

Brigitte H. Berman (Retired Petroleum Engineer and Geologist)

(7609242140)

CONSPEC INC
Construction Specialty
P.O. Box 181
Lee Vining CA 93541
(760) 647-6346 Fax (760) 647-6616

24 January 2013

BLM Field Office
351 Pacu Lane
Bishop CA 93541

Attn: Casa Diablo IV Geothermal Development Project Draft EIS/EIR
Collin Reinhardt, Project Manager

All needs to be done to allow the new proposed geothermal project to proceed at Casa Diablo. With so many of the environmental concerns taking overwhelming precedence for many years, it's time to step back a bit and give other concerns a chance to prevail or at least have equal treatment.

While protecting the environment should certainly be a continued priority it should not be the only priority. We desperately need clean energy production. The obvious economic benefits are without question a much needed boost to Mono County and California's economic disaster.

I5-1

The union question should be totally disregarded at every level. As employers in Inyo and Mono County for 45 years in the construction and trucking industry we are struggling to make ends meet. We are forced to comply with CARB requirements to an unrealistic degree and we are in compliance. Now let us work and be able to recoup our investments! Our future and the futures of our employees depend on the balanced, thoughtful use of our resources!

I5-2

Submitted by:

CONSPEC INC
Jeffrey and Kathleen Hansen

Comment Letter I6

William T. Taylor

P.O. Box 7363
Mammoth Lakes, CA 93546
760 709-6964 wthomsontaylor@gmail.com

January 28, 2013

Collin Reinhardt
Bureau of Land Management
Bishop Field Office
351 Pacu Lane, Suite 100
Bishop, CA 93514

Subject: Casa Diablo IV Geothermal Development Project

Dear Mr. Reinhardt:

Thank you for the opportunity to comment on the Joint Draft Environmental Impact Statement/ Environmental Impact Report (EIS/EIR) for the Casa Diablo IV Geothermal Development Project.

Please note for the record that I support the comments submitted by the Town of Mammoth Lakes in their entirety and will not repeat them all here. In addition to the Town of Mammoth Lakes comments please consider the following:

Affected Environment

This section lacked a detailed and quantitative assessment of the amount of dispersed recreation that takes place in the project vicinity. The Sawmill Road, Sawmill Cutoff Road, Shady Rest Park, and the surrounding area are all heavily used for dispersed recreation as well as being starting points for trails and routes that radiate out into the Inyo National Forest to the north. Users include runners, walkers, mountain bikers, snowshoers, cross country skiers, and off-highway and over the snow vehicle users. By not assessing the numbers of users by type and season, there is insufficient data to evaluate impacts, determine significance, and design appropriate mitigation. **I6-1**

Figures 3.14-1 and 3.14-2 do not show all the trails, either summer or winter, which are regularly used. Examples include the single-track mountain bike and running trail that circles around the southeast and eastern portion of Shady Rest Park in the vicinity of well #38-25 and the Blue Diamond Trail west of the Sawmill Cutoff Road. **I6-2**

Every trail and road in the area is used by a variety of recreationists. Roads that are closed to motor vehicles are still regularly used by non-motorized recreationists. The fact that some of these routes may not be National Forest system roads or trails does not make their use inappropriate or illegal. Dispersed recreation on and off established routes is common throughout the National Forest System and is an appropriate use of **I6-3**

National Forest lands provided that it is consistent with other management direction such as vehicle closures and protection of public resources. The lack of formal route designation may not exist does not invalidate most of the existing dispersed recreational uses as are consistent with the management prescriptions for the affected vicinity. I6-3 cont.

Please collect annual user data and accurate user trail information and re-publish the document with appropriate baseline information. I6-4

Environmental Consequences

Since, as noted above, the baseline recreation data is incomplete, the assessment of the impacts is incomplete. This section should be revised based on complete recreation use information. I6-5

Under Socio-Economic Consequences, there is no evaluation of the impact of the project on the community of Mammoth Lakes' recreation based business planning. Recreational trail use is an integral component of the community's overall tourism and local amenity strategy. Shady Rest and its vicinity is a key location for the staging of and participation in these uses. The Town of Mammoth Lakes General Plan and the Trail System Master Plan both speak to the importance of recreation and trails in the Town's planning. The importance of trails-based activities to the economy and social well-being of the community should have been evaluated and the effects of the project on those activities addressed. This section should be re-written. I6-6

Mitigation

At a minimum, pipelines should be buried at every trail and road crossing, whether National Forest System trail or not, unless a determination is made that the specific route is to be closed to all use. I6-7 Additionally the pipes should be placed underground at intervals of no less than 300 (100 yards) feet to minimize adverse effects to dispersed recreational use as permitted in the various management prescriptions. I6-8

Winter access to the wellhead facilities should be restricted to over the snow vehicles. Both Mammoth Community Water District and Southern California Edison access their facilities with either snow-cats or snowmobiles. From the description in the document, it does not appear that any of the regular maintenance activities at the wells requires wheeled vehicle access. This would substantially reduce the risk of accident from a dispersed user being injured while crossing one of the access routes and would better maintain the winter recreation character of the area. I6-9

Conclusion

The document should be revised to incorporate data on the amount and type(s) of dispersed recreation taking place in the project vicinity. The analysis of the magnitude and significance of the project impact cannot be made until that information is available. Well established legal recreational uses of the project area need to be recognized and I6-10

protected. Mitigation measures need to be expanded to provide that protection. **I6-10 cont.**

Thank you again for the opportunity to Comment on the Casa Diablo IV Geothermal Development Project Joint EIS and EIR

Sincerely,

William T. Taylor

William T. Taylor
Mammoth Lakes

mammoth nordic
YOUR CLUB FOR NORDIC PURSUITS

Collin Reinhardt
Bureau of Land Management
Bishop Field Office
351 Pacu Lane, Suite 100
Bishop, CA 93514
760.872.5024
creinhardt@blm.gov

RE: Casa Diablo IV Geothermal Development Project

Good morning, January 14, 2013

Thank you for the opportunity to comment on the *Joint Draft Environmental Impact Statement/Environmental Impact Report. (EIS/EIR).* Mammoth Nordic has been engaged in geothermal development project proposals since November 2006. We have submitted comments related to this project on three occasions during previous opportunities to do so. These comments are attached here for reference.

Mammoth Nordic, a 501c3 non-profit, has conceived, designed, funded, maintained and sustained a free *Community Nordic Trail System* that is the pride of our Club and our community. Our primary concern remains the overall degree of impact this proposal will have on Nordic Recreation in the Mammoth Lakes area. Due to the very limited area designated for non-motorized winter recreation, the impact of additional wells and pipelines will, on a percentage basis of the approximately 300 acres available for the ***Mammoth Nordic Trail System,*** seriously and detrimentally impact the aesthetic quality and safety of the Nordic user experience. I7-1

Two wells currently installed, #57-25 and #66-25, are audible and visible to XC skiers using the Nordic Trail System. Proposed wells #55-31, #35-31, #23-31, #12A-31, #81-36 and #77-25 will also impact the Nordic experience in similar ways. I7-2

More significantly, proposed wells #38-25, #50-25 and #15-25 will require re-routing several established Nordic trail alignments. The installation of pipelines will create serious limitations to the manner in which we conduct our nightly grooming operations. Above-ground pipelines create barriers that cannot be navigated around. Below-ground pipelines effectively cook the ground above them, creating low-snow conditions that make our grooming operations much more costly. The installation of pipeline infrastructure, whether above or below ground, also creates "hollow snow" conditions: a false sense of stable snowpack underneath XC skis or snowshoes that can suddenly break and cause the person to abruptly stop or fall to the pipe or ground level, seriously compromising Nordic recreation safety. I7-3

Mammoth Nordic is aware that the Town of Mammoth Lakes submitted comments on January 2nd, 2013. The Town shares our concern regarding the negative impacts this project will impose on the ***Mammoth Nordic Trail System,*** our many local and visiting users and quiet winter Recreation. Mammoth Nordic also shares and supports the concerns raised by the Town in their comments; specifically with regard to Air Quality, Land Use, Noise, Transportation/Traffic, Visual Impacts and Surface & Groundwater resources. I7-4

Please find included our Map of the Nordic Trail System as a reference to our comments. We appreciate the opportunity to provide our input, and trust it will lead to the best outcome for all concerned. Please feel free to contact me with any questions you may have.

Sincerely,

Brian Knox
760.914.2637 cel
brian@mammothnordic.com

Comment Letter I7



Bureau of Land Management
Bishop Field Office
Attn: Casa Diablo IV Project
351 Pacu Lane, Suite 100
Bishop, CA 93514
760.872.5006
cabipubcom@ca.blm.gov

RE: Casa Diablo IV Geothermal Development Project

Good afternoon: April 28, 2011

On behalf of our community and our membership, thank you for the opportunity to provide comments regarding the proposed Casa Diablo IV Geothermal Development Project.

I was interviewed by Austin McInerny last fall regarding this proposal by Mammoth Pacific, L.P. and provided input for a Pre-Scoping Stakeholder Assessment Report, dated November 2010. Since that time, more project information has become available, allowing me to be more specific in addressing our concerns.

Our primary concern is the overall degree of impact this proposal will have on Nordic recreation in the Mammoth Lakes area. Due to the very limited area designated for non-motorized winter recreation, the impact of additional wells and pipelines will, on a percentage basis of the approximately 300 acres available for our Community Nordic Trail System, seriously impact the aesthetic quality and safety of the Nordic user experience.

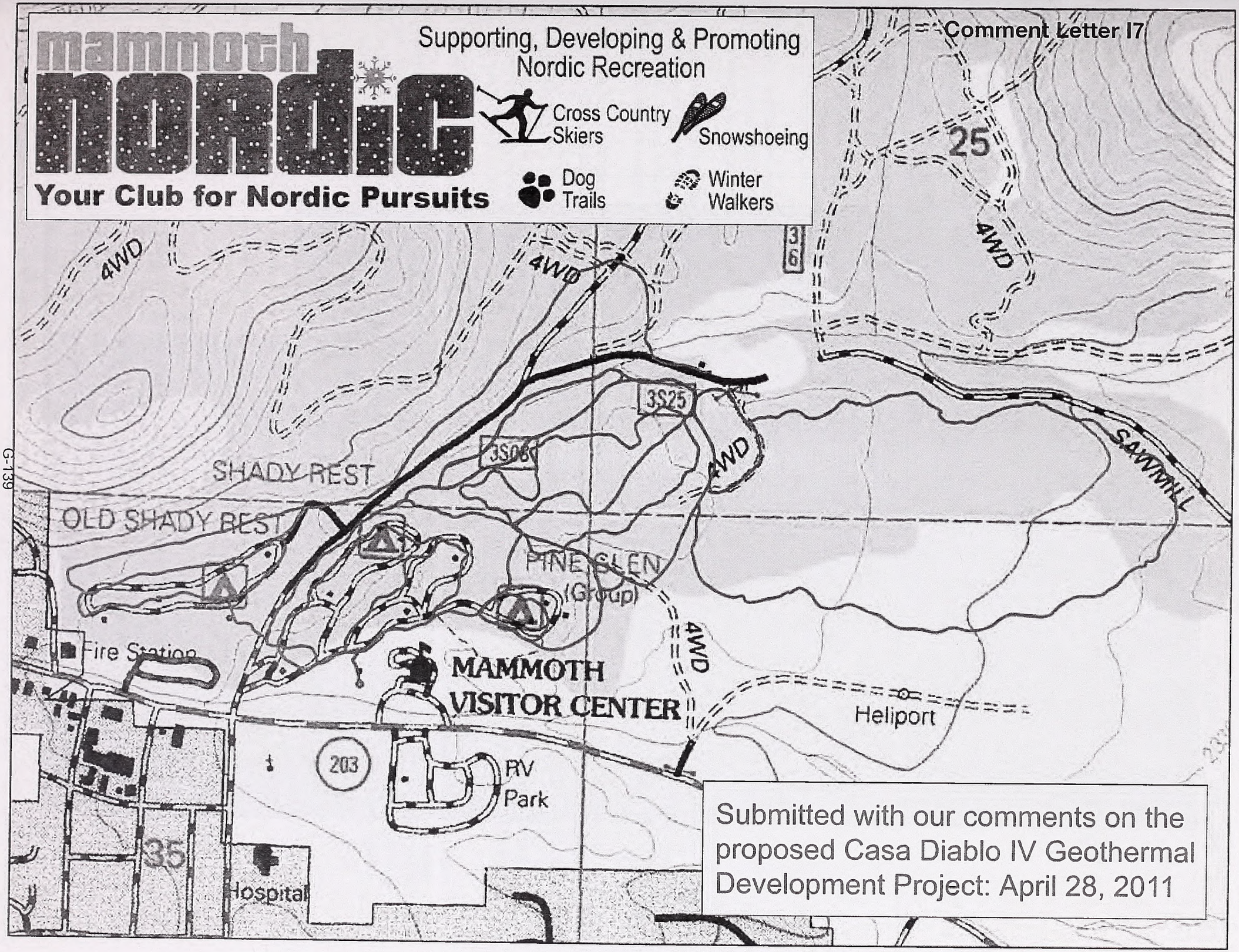
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More significantly, proposed wells #38-25, #50-25 and #15-25 will require re-routing several established Nordic trail alignments. The installation of pipelines will create serious limitations to the manner in which we conduct our nightly grooming operations. Above-ground pipelines create barriers that cannot be navigated around. Below-ground pipelines effectively cook the ground above them, creating low-snow conditions that make our grooming operations much more costly. The installation of pipeline infrastructure, whether above or below ground, also creates "hollow snow" conditions: a false sense of stable snowpack underneath XC skis or snowshoes that can suddenly break and cause the person to abruptly stop or fall to the pipe or ground level, seriously compromising Nordic recreation safety.

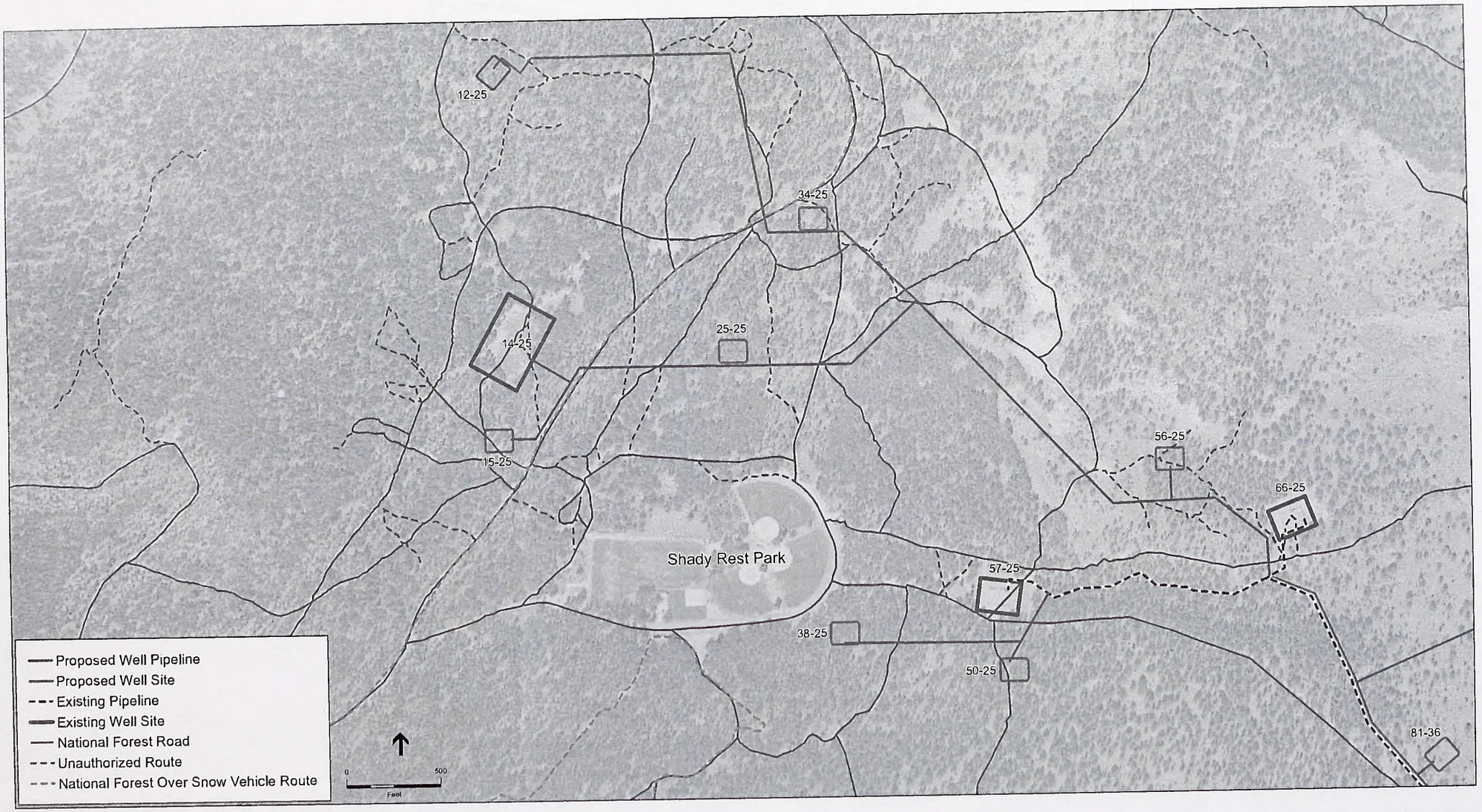
Please find included our Map of the Nordic Trail System as a reference to our comments. We appreciate the opportunity to provide our input, and trust it will lead to the best outcome for all concerned. Please feel free to contact me with any questions you may have.

Sincerely,

Brian Knox
760.914.2637 cel
brian@mammothnordic.com



Submitted with our comments on the proposed Casa Diablo IV Geothermal Development Project: April 28, 2011



SOURCE: Ormat, 2010; USFS, 2010

Case Diablo IV Geothermal Project
Figure
Shady Rest Park Transportation Network

Comment Letter I7

mammoth nordic

Your Club for Nordic Pursuits

Supporting, Developing & Promoting Alternatives for Nordic Recreation

Cross Country Skiers

Snowshoeing

Dog Trails

Winter Walkers

Mr. Ron Leiken
Ormat Technologies, Inc.
6225 Neil Road
Reno, Nevada 89511-1136
Tel.: (775) 356-9029
rleiken@ormat.com

re: Proposed expansion of Geothermal energy production in Mammoth.

Good morning Ron: March 12, 2010

It was a pleasure meeting you yesterday at the Mammoth Trails meeting. I look forward to working closely with you on the proposal to enhance geothermal energy production here in Mammoth. Please include this document in your outreach file and share it with others associated with Ormat or Mammoth Pacific Geothermal Company.

Your PowerPoint presentation at yesterday's meeting was enlightening for those unfamiliar with the plans for proposed expansion by Mammoth Pacific Geothermal Company (MPGC). I have been closely following these plans since the Fall of 2006. When Bill Dunkelberger, BLM Field Manager from Bishop, requested comments on a proposed winter access route to accommodate the drilling of the two test wells you mentioned, I replied with the letter attached.

In essence, I informed Mr. Dunkelberger and all those cc'ed that the idea of **Shady Rest Winter Park** reached back to 2001. I collaborated with Mr. Dave Wilbrecht, Town of Mammoth Parks & Recreation Director, and Kathleen Morse, INF District Ranger for Mammoth on the creation of a Winter Park utilizing an existing park facility that was lying fallow more than half the year. I encouraged him to facilitate a partnership between MPGC, the INF and the Town of Mammoth to plow approximately ½ mile of Sawmill Cutoff Road from Hwy 203 to Shady Rest Park. The rationale is simple: MPGC establishes easy access to the two new wells and **Shady Rest Winter Park** takes flight, enhancing *all* winter recreation for locals & visitors alike.

At yesterday's meeting, Jon Kazmierski from the Inyo National Forest indicated that **Shady Rest Winter Park** has been very well received, but improvements need to be made. I agree. The attached 2001 Map of the layout for **Shady Rest Winter Park** clearly indicates how to best meet the needs for snowmobile recreation: plow the remaining 600 feet to the northeast end of the second ball field and create a round-about that allows for trucks with trailers to deliver snowmobiles to the Orange Diamond trailhead, unload safely, then pull through to park facing in the correct direction to easily depart when returning from riding.

Mammoth Nordic is interested in maintaining the partnership we have established that our various organizations mutually benefit from by sustaining **Shady Rest Winter Park**. Please keep me up to speed on the process as you move forward on the expansion project.

Thanks very much and please call or reply with any questions you may have,

Brian Knox, Founder
760.914.2637 cel
access@qnet.com

Comment Letter I7

mammoth NORDIC

Your Club for Nordic Pursuits

Supporting, Developing & Promoting Alternatives for Nordic Recreation

Cross Country Skiers

Winter Walkers

Snowshoeing

Dog Trails

Bill Dunkelberger, BLM Field Manager
Bishop Field Office
351 Pacu Lane, Suite 100
Bishop, CA 93514

re: Proposed winter access route for Mammoth Pacific Geothermal Company

Good afternoon Mr. Dunkelberger: November 20, 2006

On behalf of Mammoth Nordic I appreciate the opportunity to comment on the proposed winter access route for Mammoth Pacific Geothermal Company (MPGC) to wells #57-25 and #66-25.

I have attached a map of the Pilot Winter Grooming Program approved by the Mammoth Lakes Town Council on November 16, 2006. As you can see, the proposed new road is within the existing Forest Service closure to motorized winter recreation. We respectfully ask that the BLM, Inyo National Forest and Mammoth Pacific investigate and consider partnering with the Town of Mammoth Lakes in the establishment of Shady Rest Winter Park (SRWP).

I have also attached a diagram of the SRWP Plan proposed by the Town of Mammoth Lakes in 2001. This plan creates a single staging area for a variety of winter uses, addresses access to the MPGC wells and allows the existing crown jewel of the Mammoth Parks System to be fully utilized year-round.

Mammoth Nordic has been pursuing the establishment of an enhanced winter recreation experience for all users for a number of years. We continue to support the SRWP Plan. We also believe current Inyo National Forest administrators continue to see this as a solution to user conflict and the increasing congestion at the small, multiuse staging area at the intersection of Hwy 203 and Sawmill Cut-off Road. Please see the attached minutes of the November 6, 2001 Parks & Recreation Commission meeting in which District Ranger Kathleen Morse indicates given the Forest Services' limited resources, existing multi-user support for Shady Rest Winter Park and limited support for opening a closed area to motorized winter recreation, it is the best use of Forest Service resources to pursue the Shady Rest Winter Park proposal. Also attached are Inyo National Forest comments from August 2, 2002 to the Parks & Recreation Commission again strongly supporting the SRWP Plan.

I am available at your convenience via email, phone or in person to discuss our concerns and review viable solutions. The courtesy of a written reply acknowledging receipt of our comments is appreciated.

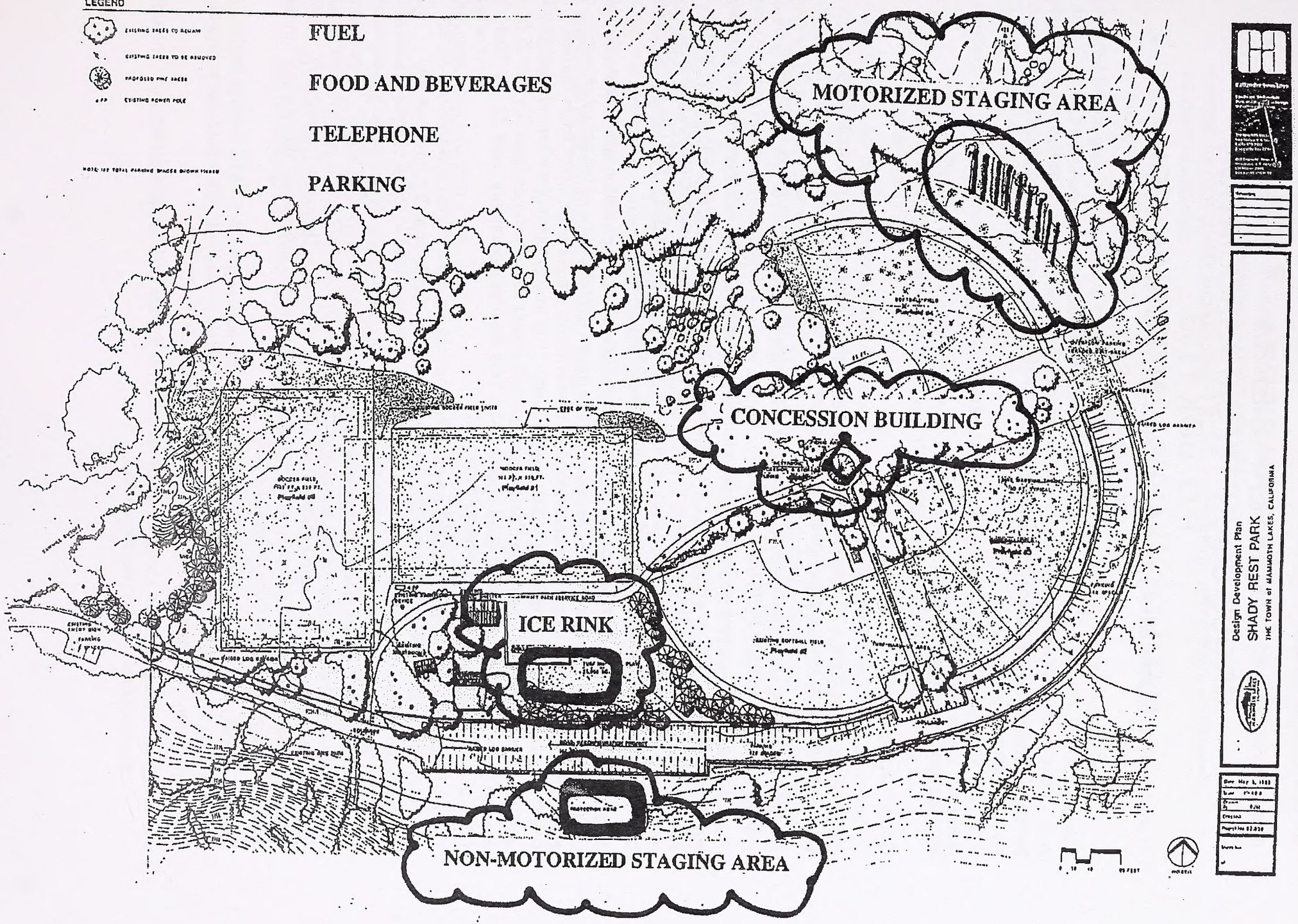
Thank you, & sincerely,

Brian Knox,
President

cc: Lynn Oliver, INF Oil & Gas Minerals Program Manager
Mike Schlafmann, INF Winter Sports Specialist
John Regelbrugge, District Ranger, Mammoth & Mono Basin Districts
Larry Nickerson, Facilities Manager, Mammoth Pacific

www.mammothnordic.com • PO Box 70 Mammoth Lakes, CA 93546 • brian@mammothnordic.com • 760.934.4667

SHADY REST WINTER RECREATION SITE



EASTERN SIERRA
CROSS COUNTRY SKI ASSOCIATION
P.O. BOX 1133
MAMMOTH LAKES, CALIFORNIA 93546
760.934.4667
760.934.4616 fax

Mr. Dave Wilbrecht, Director of Parks & Recreation
Town of Mammoth Lakes
P.O. Box 1609
Mammoth Lakes, CA 93546
760.394.8989 extn. 235

July 10, 2001

Good morning Dave:

On behalf of the ESCCSA, I would like to offer our perception of the proposed SHADY REST WINTER PARK (SRWP) as you and I have discussed thus far.

We believe that the implementation of such a year-round facility serves to address a number of concerns much in need of permanent solutions.

The Ice Rink facility has little hope of operating in the black at its' present location given the monthly lease expense of $3,500, in addition to the added cost of annual set-up, breakdown, and summer storage. By giving the facility a permanent home at a developed town facility currently going unutilized during winter months, the Town will recover a nice chunk of revenue that can be applied to the maintenance and administration of more fully utilized Park facility.

As you know, the ESCCSA has been advocating for a solution to a long-existing conflict between quiet winter sportsters and motorized recreation. The recent determination of the actual physical boundaries of the winter closure for snowmobiles (presented at the June 20, 2001 Town Council/ P & R study session) was, needless to say, enlightening. The true location of the boundaries, in addition to the significant size of the closure, very closely reflect the recommendation by our Club several years ago to incorporate a quiet sports buffer from the Town boundary, near *Shady Rest Park*, extending to the south towards the community.

Our Club has always acknowledged the need for appropriate accommodation of motorized winter recreation on public lands near Mammoth. This proposal very clearly provides for a true and equitable resolution to a conflict issue that we all very desperately need to move beyond. Establishing a location to the north and east of the SRWP for staging snowmobile activity makes sense because the bulk of the Trail System presently designated for OSV use is in fact north of SRWP. Providing a high quality Nordic experience for XC skiers and snowshoers from SRWP to the south makes sense because the entire MLTS is south of SRWP, as is the bulk of the Blue Diamond Trail System. Neither user group can martyr themselves by whining they were the ones to get booted "out of town." In fact, everyone stages or begins from the same place.

We are pleased with the decision by the TML to vigorously pursue the CA STATE PARKS NON-MOTORIZED TRAILS PROGRAM GRANT our Club has brought forward. We would like to propose a number of items for requested funding to include, but not be limited to:

- Site improvements for the permanent relocation of the Ice Rink/Skate Rink facility. (Through other available funding mechanisms.)

- A snow cat and corresponding storage and maintenance structure, perhaps large enough to house summer maintenance equipment as well.
- Funding for high quality snowshoe and XC ski trail signage, information, and trailside interpretive displays.
- A facility on-site at SRWP that can accommodate administrative and maintenance activity of P & R programs year-round.

In order for the grant application to be attractive to those who review it, The TML must clearly demonstrate their unwavering support of such a facility enhancement. The lengthy, public process that has delivered us all to this point convinces me we are prepared to make that commitment. Alas, the nagging detail of funding the associated operational expense of maintaining the MLTS for a high quality winter experience.

I believe the page 3 story in the *July 5, 2001 Mammoth Times* provides the solution:

> "The total General Fund revenue for the 2001/2002 budget is projected to be $9,210,268. Of this figure, the largest source of revenue, 54% or $4,973,544, comes from transient occupancy tax (TOT)."

We offered in our comments to the TML Planning Commission on March 19, 2000 that a modest appropriation from the TOT can finance the year-round maintenance of the MLTS. A maintenance budget of $49,735 can be created by designating a simple 1% to that line item. The enhancement of the MLTS to create a winter experience comparable to the high quality encounter available in the spring, summer, and fall is, I believe, a marketing tool. Beyond expanding the accessibility of the MLTS to the many residents who regularly enjoy it, it provides another alternative for visitors to our community that I trust the TML Marketing Department will cheerfully promote.

You may be asking yourselves, what is the ESCCSA prepared to offer? How about a couple of Cat drivers? John Dittli brings a wealth of experience from his tenure as the Tamarack XC trail boss, and I myself received acknowledgement for missing all of the cabins most of the time. Of course, our Club is interested in developing municipal Nordic programs that compliment existing programs already established within the local School System. We will do more. All you gotta do is ask.

I appreciate the opportunity to share our ideas with you all.

Sincerely,

Brian Knox
Advocacy Director, ESCCSA

cc. TML P & R Commissioners
TML Town Council
Steve Julian, TML Town Manager
Kathleen Morse, District Ranger, Inyo National Forest
John Borton, Winter Sports Specialist, Inyo National Forest
Doug Ogilvy, INTRAWEST
Rusty Gregory, CEO Mammoth Mountain Ski Area

United States Department of Agriculture
Forest Service
Inyo National Forest
Mammoth Ranger Station
P.O. Box 148
Mammoth Lakes, CA 93546
(760) 924-5500
(760) 924-5531 TDD

Comment Letter I7

File Code: 2720

Date: August 2, 2002

Town of Mammoth Lakes
Parks and Recreation Commission

Ladies and Gentlemen:

This letter will serve to clarify the Inyo National Forest's position on the issue of the bike path and the "Tunnel". As you know, the Tunnel and trail system are currently under Special Use Permit (SUP) to the Town of Mammoth Lakes as a non-motorized bicycle path through December 31, 2009. If the Town determines that it would like any changes to the existing SUP prior to expiration, an application would have to be submitted. Any amendment considerations would entail a subsequent environmental analysis.

However, it is apparent that a significant amount of baseline information is needed to aid in planning decisions regarding the "Tunnel", the Shady Rest Winter Park proposal, and all motorized and non-motorized winter use. District Ranger, Kathleen Morse, stated the Forest's preference for focusing efforts north of State Highway 203 at a November 6, 2001, Parks and Recreation Commission Meeting. Work in this area would support opportunities for multiple user group activities, assist in reducing congestion in and around the current staging area, and is supported, in concept, by the State of California Parks and Recreation Department. In fact, the State would consider a proposed snow park grant to build it and possibly maintain the potential future winter park.

The Inyo National Forest strongly supports, and has discussed with Dave Wilbrecht, the potential for a needs assessment for these uses during the 2002-2003 winter season. We are also currently investigating potential OSV funds to pursue such a study. Therefore, until information is gathered for this baseline information, the Inyo National Forest will not consider any changes to the current situation in and around the "Tunnel".

I strongly encourage both the motorized and non-motorized factions to work cooperatively and give serious consideration to the Shady Rest Winter Park concept. The Inyo National Forest and the State of California support this concept and want to explore opportunities to assist in creating

a "win-win" reality for all facets of winter recreation. It is very apparent that all sides are passionate about their particular form of winter recreation. Our common bond is our love for enjoying the great out of doors. With that common thread I'm encouraged that a solution can be found.

Sincerely,

JoELLEN J. KEIL
Acting District Ranger

Cc: Nancy Coleman, Mammoth RV Park
Barry Jones, State of California Parks and Recreation Department
Brian Knox, Eastern Sierra Cross Country Ski Association
Mammoth Lakes Planning Commission
Bill Sauser, Mammoth Snowmobile Club
Jeff Bailey, Forest Supervisor

Comment Letter I7

mammoth nordic

Your Club for Nordic Pursuits

Supporting, Developing & Promoting Alternatives for Nordic Recreation

Cross Country Skiers

Winter Walkers

Snowshoeing

Dog Trails

Bill Dunkelberger, BLM Field Manager
Bishop Field Office
351 Pacu Lane, Suite 100
Bishop, CA 93514

re: Proposed winter access route for Mammoth Pacific Geothermal Company

Good afternoon Mr. Dunkelberger: November 20, 2006

On behalf of Mammoth Nordic I appreciate the opportunity to comment on the proposed winter access route for Mammoth Pacific Geothermal Company (MPGC) to wells #57-25 and #66-25.

I have attached a map of the Pilot Winter Grooming Program approved by the Mammoth Lakes Town Council on November 16, 2006. As you can see, the proposed new road is within the existing Forest Service closure to motorized winter recreation. We respectfully ask that the BLM, Inyo National Forest and Mammoth Pacific investigate and consider partnering with the Town of Mammoth Lakes in the establishment of Shady Rest Winter Park (SRWP).

I have also attached a diagram of the SRWP Plan proposed by the Town of Mammoth Lakes in 2001. This plan creates a single staging area for a variety of winter uses, addresses access to the MPGC wells and allows the existing crown jewel of the Mammoth Parks System to be fully utilized year-round.

Mammoth Nordic has been pursuing the establishment of an enhanced winter recreation experience for all users for a number of years. We continue to support the SRWP Plan. We also believe current Inyo National Forest administrators continue to see this as a solution to user conflict and the increasing congestion at the small, multiuse staging area at the intersection of Hwy 203 and Sawmill Cut-off Road. Please see the attached minutes of the November 6, 2001 Parks & Recreation Commission meeting in which District Ranger Kathleen Morse indicates given the Forest Services' limited resources, existing multi-user support for Shady Rest Winter Park and limited support for opening a closed area to motorized winter recreation, it is the best use of Forest Service resources to pursue the Shady Rest Winter Park proposal. Also attached are Inyo National Forest comments from August 2, 2002 to the Parks & Recreation Commission again strongly supporting the SRWP Plan.

I am available at your convenience via email, phone or in person to discuss our concerns and review viable solutions. The courtesy of a written reply acknowledging receipt of our comments is appreciated.

Thank you, & sincerely,

Brian Knox,
President

cc: Lynn Oliver, INF Oil & Gas Minerals Program Manager
Mike Schlafmann, INF Winter Sports Specialist
John Regelbrugge, District Ranger, Mammoth & Mono Basin Districts
Larry Nickerson, Facilities Manager, Mammoth Pacific

www.mammothnordic.com • PO Box 70 Mammoth Lakes, CA 93546 • brian@mammothnordic.com • 760.934.4667

ORMAT®

January 29, 2013

Casa Diablo IV Geothermal Development Project Draft EIS/EIR
Attention: Collin Reinhardt, Project Manager
Bureau of Land Management
Bishop Field Office
351 Pacu Lane, Suite 100
Bishop, CA 93514

Re: Comments on Casa Diablo IV Geothermal Development Project Draft EIS/EIR
DOI Control # DEIS 12-21
State Clearinghouse No. 2011041008

Dear Mr. Reinhardt:

Ormat Nevada, Inc. (Ormat) respectfully submits the following comments on the above referenced document. The applicant, ORNI 50 LLC, is a wholly owned subsidiary of Ormat. The comments below are arranged by topic.

GENERAL/DOCUMENT-WIDE

Misrepresentation of Well Pad Size
Page 1-5 Figure 1-1 and all well field figures
Comment: Well pad 14-25 is shown substantially larger than the other wellpads even though all wellpads will be the same size once completed and the drilling sumps reclaimed.
Recommendation: Show all final well pad sizes the same in the figures. I8-1

CHAPTER 1 - INTRODUCTION

No comments

CHAPTER 2 - PROPOSED ACTION AND ALTERNATIVES

Existing and Planned Access Roads
Page 2-22 Section 2.2.4.4
Comment: Note that the project description submitted by ORNI 50 LLC stated that "access roads for production wells would be constructed using a durable road surface." To clarify, it is only the new sections of these access roads that would be constructed using road base material – just from the existing primary access road to the well pad, not the entire road network in Basalt Canyon. It would certainly create an environmental and recreational impact to I8-2

ORMAT NEVADA, INC.
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reconstruct all the roads in Basalt Canyon to have "durable road materials" or roadbase, and that is not what the applicant proposed.
Recommendation: Please clarify that only new access roads from the primary existing road to the well pad would be constructed using road base material. I8-2 cont.

Access Road Maintenance and Plowing
Page 2-37 Section 2.2.7.3 and Exhibit B – "Recommendations for Snow Plowing on Native Surface Roads"
Comments:

1. Snow to be left on the road is problematic and won't work for wheeled vehicles even with chains. It will create more ruts and erosion under the snow during the winter months with thaw and freeze periods. The wheeled vehicles would get stuck all the time following this condition.
2. BMPS are mentioned that are not practical to abide by, when there is a lot of snow all the markings disappear and these requirements are not currently complied with in the area.
3. Paving is very expensive and is costly to maintain, and would create environmental and recreational impacts in Basalt Canyon.
4. These BMPS would force Ormat to use snow machines or snow cats which are labor intensive and costly. When a well needs to be maintained the larger equipment cannot access it without plowing.

I8-3

In case of an emergency ORNI 50 LLC needs to have access to the wells and pipelines to address the problem regardless of the time of year.
Recommendation: The Shady Rest Park area is not like other areas in the National Forest system where the proposed BMPS may work. Due to the proximity to Hwy 203 and extensive use by the public site, site specific snow plowing should be developed based on what has historically worked in the area working with locals who plow it currently and have experience with the road surfaces specific to Basalt Canyon.

Section 2.4.3.4, Access Roads- Alternative 3
Page 2-73 Section 2.4.3.4
Comment: The description of Alternative 3 seems to be requiring that the applicant widen and pave Sawmill Cutoff Road between SR203 and well pad 34-25. It appears the USFS is using the CD-4 project to address a perceived road problem with a major road construction project that will add millions to the cost of the project. Sawmill Cutoff Road is and will only be minimally used by the project compared to the other users. This road is used extensively by the public, including the Town of Mammoth Lakes and the USFS to access the campgrounds and Shady Rest Park year around. The road will be used primarily by a regular vehicle once/day when construction is complete. Requiring this project to rebuild this road will be an economic detriment to this project. The use of asphalt is expensive to install and maintain and may leach oil into the native soil. Additionally, it seems that widening would not be environmentally preferable as it would require removal of many trees and widening and paving would change the character of the road and the area. I8-4
Recommendation: Remove the widening and paving of this road from the description of Alternative 3, the preferred alternative. Add a road mitigation fund to the Town's use permit that requires all users to pay a fee. The project pays into the fund when a well is drilled, $10,000/well. Define durable road requirement that impacts all users of the Shady Rest Park area including the Town's use, not just this project.

Condition of Roads, Pre-Project
Page 2-45
Comment: TR-2 needs to be documented prior to commencing work with a USFS road engineer to agree on the scope of the repair expected. As written it is too ambiguous and could be used to make the project fix problems not due to its construction or operations.
Recommendation: ORNI 50 LLC will work with the USFS road engineer to address damage done specifically by the project on Sawmill and Sawmill Cutoff Roads. I8-5

Cultural Resources Mitigation
Page 2-48 CUL-1
Comment: There is no place in the DEIR/EIS where "all the requirements of the USFS and CA SHPO" are outlined. It is difficult to know if the project can comply without knowing what these are or will be for the area.
Recommendation: Rewrite this mitigation measure and/or spell out the requirements prior to approval of the project for the project to review. I8-6

AIR RESOURES

Statement Correction
Page 4.2-4
Comment: The last part of the sentence, "The fugitive n-pentane, which is considered an ROG, would be released to the atmosphere or would leak into the geothermal lines" is incorrect. This is not true with the new design as proposed for CD-4. The pressure of the geothermal brine is greater than the n-pentane; therefore, any leaks in the system would be brine into motive fluid. This would be quickly detected and the plant shut down to locate and repair the leak.
Recommendation: Delete the last part of the sentence "or would leak into the geothermal lines." I8-7

Significance Thresholds:
Pages 4.2-6, 4.2-7, among other uses of the thresholds throughout the AQ analysis Section 4.2 and other places where air quality impacts are referenced.
Comments: As stated on page 4.2-6, the GBUAPCD has not developed specific significance thresholds for construction or operation emissions. This is true, and the analysis should go with that, but the document misuses these thresholds, as explained below.

- First, in addition to the GBUAPCD not having any significance thresholds, CEQA also does not have any numerical/quantitative thresholds for emission rates of ozone precursors (only if it would violate an air quality standard). It is up to each Air District in California on if and how they develop quantitative thresholds.
- Second, the significance thresholds referred to in Imperial County APCD's CEQA Air Quality Handbook are designed to be only screening guidelines for assisting a Lead Agency in making a determination on the type of environmental document to prepare – a Negative Declaration or a Mitigated Negative Declaration or EIR (see page 8 of those Guidelines). These quantitative criteria are not intended to be used as an absolute rule that emissions are significant if they exceed these criteria. The Imperial County guidelines state that if these criteria are exceeded, further analysis would then be required to help identify the level of emissions and the subsequent level of impact – not that they are automatically significant if they exceed the criteria. I8-8

- Furthermore, even though both of these counties are "rural" and "have existing and proposed geothermal projects," that is not enough in common to use the same air quality guidelines. The air basins and the sources of pollution are quite different. Imperial County has a much more serious ozone issue than Mono County/Great Basin, being that it exceeds both state and federal ozone standards. It makes sense that the thresholds are therefore more stringent in Imperial County.
- As the Bay Area Air Quality Management District (BAAQMD) recently stated, based on its attempt at setting significance thresholds, "a lead agency should rely on substantial evidence most appropriate for the project being studied" (BAAQMD CEQA Air Quality Guidelines, Updated May 2012). CEQA encourages local agencies to adopt thresholds of significance to evaluate environmental impacts so long as those thresholds are supported by substantial evidence and adopted through a public review process (per information from newsletter on http://www.wendel.com; and supported by Public Resources Code § 21082; 14 Cal. Code Regs. §§ 15064.7, 15064.4 (addressing GHG impacts); also Citizens for Responsible and Equitable Environmental Development v. City of Chula Vista (2011) 197 Cal.App.4th 327)). I8-8
- The thresholds used in the CD-4 analysis are not appropriate for use for the CD-4 project in Mono County because these thresholds have not been adopted through a public review process and are not supported by substantial evidence.

Recommendation: On the basis of the discussion and points made above, remove the ICAPCD significance thresholds from the document/analysis, particularly pages 4.2-6 and 4.2-7. This then relates to the other discussions below.

Construction-Related NOx Emissions

Pages ES-8 and 9, and Section 4.2

Comments:

- As stated above, the Imperial County significance thresholds used in this analysis are not applicable here.
- Some air jurisdictions in California that have quantitative thresholds for operational emissions do not have similar thresholds for construction emissions – such as the Santa Barbara County Air Pollution Control District (SBCAPCD). As explained in its CEQA guidelines, they do not have impact significance thresholds for construction-related air emissions because the total emissions associated with all construction within the air basin is considered less than significant. They do have policies to reduce dust and particulate matter emissions and construction equipment emissions to the extent feasible to minimize the incremental contribution of construction emissions to cumulative air pollution.
- Like Imperial County, Santa Barbara County is also not a comparison to Great Basin, however, the logic in not having significance thresholds for construction but implementation of good construction management practices and techniques to prevent fugitive dust from creating a nuisance is applicable to the CD-4 project. I8-9
- The CD-4 document concludes that the construction emissions are significant and unavoidable. Ormat has not seen that in any of our previous EIRs including for much larger development projects Construction emissions are usually considered short-term and temporary and can be mitigated to less than significant. Ormat believes that the construction emissions from the CD-4 project should likewise be less than significant even if reasonable mitigation measures are proposed.
- Furthermore, the analysis in the CD-4 DEIR/EIS does not emphasize the emissions of issue, NO_x primarily from the drill rig engines, would only be short-term and temporary emissions during periods of drilling.

- Also, the drill rigs would be located several miles away from the power plant construction equipment, so the dispersion of the NO_x emissions would be quite different and would not have an additive or combined effect as ozone precursors or a health hazard. Therefore, the emissions from equipment used for power plant construction, well construction, and pipeline construction should not be added together. They are not all at the same location at the same time and the emissions would disperse so that they would likely not combine in downwind locations.

Recommendations: I8-9 cont.

1. Remove the quantitative ICAPCD significance thresholds used for the construction emissions analysis;
2. Separate the construction emissions so that emissions that would disperse before combining are not added together;
3. Emphasize in the analysis that construction emissions are short-term and temporary;
4. Change the conclusions in Section 4.2.4.2, CEQA Significance Determination so that construction emissions would not be considered significant and unavoidable or cumulatively considerable.

Ozone Impacts

Pages ES-8, 4.2-11, 4.2-14 and 15; among others

Comment:

- The document makes a conclusion that fugitive n-pentane emissions would result in a CEQA significant and unavoidable impact. Ormat strongly disagrees with this conclusion, and it is also completely inconsistent with the analysis and conclusions in the recent M-1 Replacement Project EIR as well as the GBUAPCD's comments on that EIR in a letter dated November 6, 2012 to the Mono County Board of Supervisors.
- The analysis in the MP-I Replacement Project EIR is a more complete and advanced analysis than in the CD-4 document, thus the differences in conclusions. Two of the issues that should be addressed here are (1) significance thresholds, (2) formation of ozone.
- As discussed above, the "significance thresholds" used in this analysis should not apply to this project. Instead of using quantitative "thresholds" for determining ozone impacts, a qualitative discussion can be expanded such as was done in the MP-1 Replacement Project EIR and expanded upon in the letter (attached).
- As explained in the attached letter from GBUAPCD, ozone in Mono County is largely formed in and transported from the San Joaquin Valley, not formed in Mono County. I8-10
- VOCs that are actually emitted in Mono County are very unlikely to contribute to any ozone formation within the Great Basin. The amount of VOC emissions from the CD-4 project are negligible and completely insignificant compared to the natural emissions of VOC in the region, as explained in GBUAPCD's letter.
- While VOC emissions from CD-4 are greater than M-1, they are still less than significant given that the significance "thresholds" used for CD-4 were misused and the fact that the ozone issues in this air basin are from transported ozone, not created within the basin.

Recommendation: Revise the air quality analysis and conclusions to remove the significance thresholds, expand on the ozone impact analysis, incorporate the comments by GBUAPCD on the MP-1 Replacement Project, which should all have an effect on re-characterizing the ozone impact to less than significant. This would also change the conclusions in Section 4.2.4.2, CEQA Significance Determination so that operational emissions would not be considered significant and unavoidable or cumulatively considerable.

Project Alternatives – Air Quality
Sections 4.2.5 and 4.2.6
The above comments and GBUAPCD's letter on the G-1 Replacement Project EIR apply to the conclusions for the project alternatives as well. I8-11

Cumulative Impacts– Air Quality
Section 4.2.8
The above comments and GBUAPCD's letter on the G-1 Replacement Project EIR apply to the conclusions for the cumulative impacts as well – because the methods and conclusions of the air quality analysis are incomplete and invalid, and should not have any significant and unavoidable impacts. Accordingly, the cumulative impacts should also be changed. I8-12

Mitigation Measure AQ-1
Page 4.2-20
Comment: This mitigation measure is not practical to achieve, to require contractors to use equipment that emits "20 percent less than recent CARB fleet average." Neither contractors nor Ormat have the tools to determine fleet averages or what has 20 percent reduction. When Ormat verbally asked what this measure means and how to meet it GBUAPCD staff responded "that equipment that meets the current statewide diesel Airborne Toxic Control Measure (ATCM) standards would qualify to meet this 20 percent less than fleet average measure."
Recommendation: To help make this mitigation more feasible to comply with, add that equipment meeting the current ATCM standards meet this mitigation measure. I8-13

Residual Impacts after Mitigation Incorporated – Air Quality
Section 4.2.10
Application of all the comments above should result in the residual impact being recharacterized as less than significant after mitigation. I8-14

Credibility of Air Resources Commenter
Due to the very technical nature of the comments on the Air Resources section, Ormat would like to provide an overview of the qualifications of the reviewer: Ron Leiken has 28 years of environmental experience including many years as an air quality specialist, preparing air quality portions of numerous CEQA and/or NEPA documents, air permit applications, and technical air quality studies for a wide variety of projects. He was also a Certified Air Permitting Professional by the San Joaquin Valley Unified Air Pollution Control District. He was the key author of the Fresno County Clean Air/Ozone Attainment Plan, and has worked on numerous air quality projects throughout California. I8-15

BIOLOGY – VEGETATION

Revegetation and Landscaping
Page 3.3-6 top of page
Comment: Re-vegetation in the Basalt Canyon area for previous drilled wells and the pipeline did not occur spontaneously. Re-vegetation was done upon completion of the project and timed with the proper planting season for the vegetation. There is an excellent track record in Basalt Canyon for the previous re-vegetation that is not accounted for in the DEIR/EIS.
Recommendation: Re-vegetation should be completed after construction is done in a specific area and timed with the proper season for vegetation to be planted. This would be addressed in the Revegetation Plan approved the USFS botanist familiar with the area. I8-16

Size of RCA
Section 3.3.1.6, Page 3.3-11
Comment: The last sentence of the 2nd paragraph states that the RCA is 3400 feet wide.
Recommendation: Correct to 300 feet.

I8-17

Mitigation Measures
Page 4.3-3 and 4.4-3 (under Wildlife)
Comment: PDM BIO-7, as one example, does not match other mitigation measures in the document.
Recommendation: Check mitigation measures for consistency.

I8-18

BIOLOGY - WILDLIFE

Sierra Marten
Page 3.4-10
Comment: The project area has low, not medium foraging and nesting habitat for Martes americana sierrae, Sierra marten.
Recommendation: Change the potential to occur from medium to low.

I8-19

CLIMATE CHANGE

Significance Thresholds
Page 4.5-9 Section 4.5.4.3 a)
Comment: Similar to the CEQA significance criteria addessed in the air quality section above, the South Coast Air Quality Management District's rules were used to generate a comment instead of just stating the the Great Basin Air Quality Management District does not have a criteria.
Recommendation: Remove the use of the SCAQMD rule as the criteria and state the GBAQMD does not have a rule.

I8-20

CULTURAL AND PALEONTOLOGICAL RESOURCES

No comments

GEOTHERMAL AND GROUNDWATER RESOURCES

No comments

GEOLOGIC, SOIL AND MINERAL RESOURCES

Grading Plan Jurisdiction
Page 3.8-25
Comment: The Town of Mammoth Lakes does not have jurisdiction to review the grading plans for this project. Grading plans on public lands come under the jurisdiction of the BLM and potentially the USFS by submittal of a Sundry Notice to the BLM for approval.
Recommendation: Correct this error in the Final EIR.

I8-21

Geotechnical Investigation
Page 4.8-8
Comment: GEO-2 directs ORNI 50 LLC to conduct a geotechnical investigation of the project site. A Sundry Notice to perform this work was submitted in October 2010 to assist in reviewing the appropriateness of the proposed power plant site.
Recommendation: The BLM should approve the Sundry Notice as soon as possible to faciliate this work. I8-22

Subsidence
Page 4.8-10
Comment: Mitigation measure GEO-3 is proposed to address potential subsidence. The building code required in Mono County accounts for subsidence in the pipeline design. There is existing elevation data in Basalt Canyon from the survey data for the well heads when they are installed that is also submitted to the BLM. The geology of this area is not like the geothermal project areas that have experienced subsidence.
Recommendation: Delete GEO -3 as it is not needed due to existing building codes and other requirements that address this concern. I8-23

Subsidence
Page 4.8-10
Comment: Construction of the previous Basalt Canyon pipeline project encountered basalt for the pipe supports; thus, subsidence is not a concern in the project area. Additionally, subsidence is taken into account in the pipeline design as required by building codes.
Recommendation: Delete GEO -2 as it is not needed due to existing building codes and the geology of the Basalt Canyon area. I8-24

Monitoring
Page 4.8-20
Comment: The Basalt Canyon area, and the entire Long Valley Caldera are already part of the Long Valley Hydrologic Advisory Committee's review area. Data is reviewed semi-annually to address any concerns that may include additionally monitoring.
Recommendation: GEO-3 attempts to conditions to monitor the project area that are redundant and not needed. As previously noted for other reasons delete GEO 3 as it's already being done. I8-25

GRAZING, WILD HORSES AND BURROS

Size of Permanently Lost Grazing Area
Section 4.9
Comment: It is stated in this section that 15.3 acres of livestock grazing habitat would be permenantly removed by the project. It is not immediately apparent how this 15.3 acres was calculated. It is also not apparent whether this full 15.3 acres is real and actual livestock grazing habitat – if it does have grazing value and if it is currently leased or used for grazing. The analysis does not mention that the project also has beneficial impacts to livestock grazing, as the current sheep rancher uses the existing Basalt Canyon pipeline to help herd sheep and the sheep feed on vegetation planted by Mammoth Pacific LP.
Recommendation: Please clarify how this 15.3 acres was calculated and please verify that all of this 15.3 acres is actual livetock grazing habitat and if it is actually used for grazing – if the full 15.3 acres is real and useable grazing habitat that would be lost. Please also discuss the benefits of the project for grazing. I8-26



LAND USE

Existing Land Use
Pages 3.10-1 and -2
Comment: The description of existing land uses does not address the fact that the area is not "pristine" – that it was once completely logged and there was a sawmill, that it is currently in heavy use not only by nonmotorized uses but by motorized use such as ATVs, on-road and offroad vehicles and dirt bikes, snowmobiles, and recreational shooting. I8-27
Recommendation: Add the information stated above to the land use setting section on the above-referenced pages.

NOISE AND VIBRATION

Sensitive Receptors (Noise and Air) - Residence at Chance Ranch
Sections 3.2.1.4 (Air), 4.2 (Air), 3.11 and 4.11 (Noise)
Comment: The EIR/EIS lists the nearest residence to the project as the Chance Ranch which is toward Hot Creek. Ormat has learned that this property was purchased some time ago by the LADWP, and no one lives there. The nearest residence to the south would be the employee residences at the Fish Hatchery. I8-28
Recommendation: Remove Chance Ranch as a residence from both the Air Resources and Noise and Vibration sections.

Existing Noise Sources
Page 3.11-5
Comment: The description of existing uses in the area does not address the fact that the area is not quiet and pristine – that it was once completely logged, that it is currently in heavy use not only by nonmotorized uses such as those referenced on page 3.11-6, but also by motorized recreational use such as ATVs, on-road and offroad vehicles and dirt bikes, snowmobiles, and recreational shooting. In fact, there is a shooting range near the proposed CD-4 plant site, and there is target shooting throughout the area. So the "sensitive receptors" in the area already co-exist with noise-generating recreational uses. I8-29
Recommendation: Add the information stated above to the noise setting section on the above-referenced page.

Noise from Project-Related Traffic
Page 4.11-6
Comment: The referenced page states that "Project construction activities would contribute to overall environmental noise levels. As described in Section 4.16, Traffic, *Transportation, and Circulation*, construction-related traffic would be expected to result in a total of up to 654 daily trips." Section 4.16 indicates that the total daily trips is 277 with total one-way trips at 554. Even though the noise from this traffic is stated to be insignificant, the number should be corrected and it should be stated that construction traffic will be distributed between the plant site on the east side of Highway 395 and in Basalt Canyon on the west side of Highway 395, and therefore ALL of the daily trips from construction will not be located on the same roads. Additionally, this paragraph does not indicate that these construction trips are temporary, short-term. I8-30
Recommendation: Correct the number of daily trips; indicate that not all of these trips will be along the same roads – they will be distributed between the plant site and the well field, and indicate that noise from this traffic would be temporary – during the construction period only.



Context of Noise
Section 4.11
Comment: The noise section does not adequately put the noise generation in context of the existing noise environment. As discussed above, in addition to nonmotorized recreation in the project area, there is heavy motorized recreational use such as ATVs, on-road and offroad vehicles and dirt bikes, snowmobiles, and recreational shooting including a shooting range near the proposed plant site.
Recommendation: Add more context of the existing noise environment, including that it is not uncommon to hear engine noise in the entire project area (including near Shady Rest Park, page 4.11-8), and recreational shooting in the area especially near the power plant site.

I8-31

POPULATION AND HOUSING

No comments.

PUBLIC SAFETY, HAZARDOUS MATERIALS AND FIRE

No comments.

RECREATION

Mitigation Measure
Page 4.14-2
Comment: LU-1 is inconsistent with VIS-3 which is what has historically been done on projects in the INYO National Forest including the existing Basalt Canyon pipeline.
Recommendation: Rewrite LU-1 to make it consistent with VIS-3.

I8-32

SOCIOECONOMICS AND ENVIRONMENTAL JUSTICE

No comments.

TRAFFIC, TRANSPORTATION, AND CIRCULATION

Page 4.16-3 Table 4.16-1
Comment: Adding all the trips together is not an accurate representation of the construction traffic.
Recommendation: Divide the table up into Phase I and Phase II construction, as the power plant construction traffic is in a different area geographically from the well drilling and isn't done 24 hours/day. It is also only done in six months per year.

I8-33

Mitigation Measure TRA-1
Section 4.16.9
Comment: This does not specify what County roads are affected, and also doesn't take into account that the projects in question may take place at different times.
Recommendation: Please specify what roads are of concern, and also indicate that if there are no other projects taking place at the same time, this mitigation measure is not necessary.

I8-34

UTILITIES AND PUBLIC SERVICES

"Utility"
Page 3.17-3 Section 3.17.2.1
Comment: The only "utility" on private land for the CD 4 project is the pipeline and the definition of utility in the Mono County Land Use Code does not include pipeline. This section is not applicable except for setback purposes.
Recommendation: Correct this error in the FEIR. I8-35

VISUAL RESOURCES

Undergrounding of Pipes
Page 4.14-6
Comment: Mitigation Measure VIS-1 (Landscape Plan) requires immediate landscaping in front of certain sections of pipeline. The Inyo National Forest is not a building such that landscaping is feasible. For example, planting fullsize Jeffery Pines to shield a new pipeline will not succeed. Revegetation has been successfully done in the Basalt Canyon area for previous geothermal projects along with painting a color to camouflage pipelines or other features. Planting immediately isn't always feasible either as planting needs to be done at the correct time of year for success.
Recommendation: Change the requirement of immediate landscaping to revegation of new construction will be completed during the proper planting season per the revegetation plan approved by the Forest Botanist. I8-36
Page 4.14-7
Comment: Undergrounding of long sections of piping is not technically feasible in Basalt Canyon due to the uneven terrain. Even between well pad locations 34-25 and 25-25 it is not feasible without cutting a very deep trench to maintain a constant slope.
Recommendation: Remove the requirement to underground any long sections of pipeline in the Basalt Canyon area. I8-37

Landscaping
Page 4.18-5
Comment: VIS-4 is inconsistent with LU-1. Additonally, VIS-4 is doable and practical whereas LU-1 is not.
Recommendation: Rewrite LU-1 to make it condition that's feasible in the USFS landscape. I8-38

Drilling Days
Page 4.18-15
Comment: Under construction related drilling effects if seems to imply that drilling will only take 30-days. This could be true but if there are problems during drillng or the well needs to be redrilled it could go much longer. ORNI 50 LLC wants to insure there is no time limit on the drilling operations that would require the rig to move after 30-days even if the well isn't completed.
Recommendaton: Clarify that there is no time restriction on the days necessary to drill a well. I8-39

Landscape Plans
Page 4.18-28
Comment: VIS-1 requires that the Landscape Plan accomplishes landscape implementation 1 year prior to construction. This isn't feasilble. For example, should the project be approved in the summer of 2013 it is possible construction would start in 2013. How would landscaping be I8-40

accomplished prior when the approval and approval date are unknown and the exact well locations are pending? Additionally there is no water in the project area unless it's trucked in.
Recommendation: Remove the requirement that landscaping be completed 1 year prior to construction and replace that revegetation will be done upon completion of construction and at the time of year that is appropriate for the vegetation being planted in coordination with the USFS botanist. I8-40 cont.

Pipeline Routing
Page 4.18-30
Comment: VIS -2 is interpreted to mean that the pipeline would have to be designed to approach the pipeline crossings by going under them as opposed to over them.
Recommendation: Although the engineering and construction of this proposed design is feasible it is more expensive and the visual concern for this very short section of piping that is greater than 4 feet above grade could just as easily be mitigated with vegetation. Additionally, the pipeline will be painted to blend in with the surrounding area. I8-41

WATER RESOURCES

Grading Plan Jurisdiction
Page 3.19-12
Comment: Mono County does not have jurisdiction to approve the grading plans on public lands. The BLM will approve grading plans for the project submitted by a Sundry Notice.
Recommendation: Correct the error in the FEIR. I8-42

Impervious Surfaces
Page 4.19-16
Comment: In Table 4.19-1 well pads and pipelines are listed as impervious surfaces. Well pads are dirt and the only area of the pipelines that is impervious is the small area around the footing that is concrete.
Recommendation: Correct the table for well pads and pipelines. I8-43

OTHER REQUIRED CEQA/NEPA CONSIDERATIONS

No comments

If you have any questions or comments about any items in this letter, please contact me.

Sincerely,

Charlene L Wardlow

Charlene L Wardlow
Director Business Development

Attachment: (1)

Comment Letter I8

Theodore D. Schade
Air Pollution Control Officer



GREAT BASIN UNIFIED AIR POLLUTION CONTROL DISTRICT
157 Short Street, Bishop, California 93514-3537 www.gbuapcd.org
Tel: 760-872-8211 Fax: 760-872-6109 info@gbuapcd.org

November 6, 2012

Mr. Gerry Le Francois, Principal Planner
Mono County Community Development Department Planning Division
Mammoth Lakes, CA 93546

Re: Appeal to Mammoth Pacific's M1 project FEIR

Dear Mr. Le Francois,

Because of the type of geothermal power plant that Mammoth Pacific utilized at the Casa Diablo Known Geothermal Resource Area (KGRA), there are emissions of Volatile Organic Compounds (VOCs). The VOC emitted currently at the Mammoth Pacific plants is isobutane. The M1 project will emit a different VOC; pentane. Neither of these VOCs are recognized by the California Office of Environmental Health Hazard Assessment as health concerns. VOCs are, however, "precursor pollutants" that can contribute to the formation of ozone. Ozone is a "criteria pollutant" recognized by the US EPA as causing detrimental impacts to health. Ozone formation occurs when oxides of nitrogen and VOCs react in the atmosphere in the presence of sunlight.

In the past, exceedances of the hourly state ozone standard have occurred in Mammoth Lakes. These state standard exceedances occurred on several days a year, and took place during the late afternoon or evening hours, which indicates the cause is transport from another air basin. The California Air Resources Board found that high ozone concentrations in the Great Basin Valleys Air Basin, which includes Mono County, is classified as having ozone violations due to overwhelming transport of ozone and ozone precursors from the San Joaquin Valley. The CARB staff report states that the responsibility for a violation caused by "overwhelming" transport lies with the upwind area. (CARB, 2001) In addition, the relatively small amount of VOC emissions associated with the project (0.1 T/d) would not be expected to affect the overall amount of VOCs produced in the Mono County area, because the emissions inventory is dominated by natural VOC emissions associated with the surrounding forests, which CARB estimates at around 20.91 T/d. (CARB, 2012) I8-44

When the District reviews permit applications, we first look at the applicable regulations. Most of the VOC emissions from these geothermal plants are fugitive emissions associated with VOC leaks from valves and flanges and other sources that are not easily controllable at single points, such as an exhaust stack. There is a small amount of pentane emissions, about 2 pounds per day, emitted through a system that liberates ambient air that has contaminated the pentane working fluid. Fugitive emissions are not considered for applicability of Title V permitting. Geothermal binary power plants are not one of the source categories for applicability of the federal regulations for New Source Performance Standards or National Emission Standards for Hazardous Air Pollutants.

The District has two rules that govern the permit conditions of geothermal plants;

- District Rule 424, *Geothermal Emissions Standards*, regulates sulfur compounds to less than 100 grams per Megawatt hour from power plants. As the geothermal brine is not allowed to "flash," or boil, sulfur compounds are not liberated by Mammoth Pacific geothermal power plants.

- District Rule 209-A, *Standards for Authorities to Construct*, requires that facilities emitting over 250 pounds per day of criteria pollutants or their precursors, utilize Best Available Control Technology (BACT). This new plant has conditional approval to operate, which limits their emissions to no more than 205 pounds per day of VOCs (Ozone precursor). Therefore BACT requirements are not triggered.

I8-44 cont.

The District will issue the M1 project an Authority to Construct that requires monitoring of the pentane levels and frequent checking of likely areas that pentane would leak to assure compliance with their fugitive emission limits.

As far as concurrent emissions from both the MP1 and M1 plants, the District has permitted each as a standalone stationary source.

Attached are inaccuracies found by the District in the two appeals letters.

Thank you,

Duane Ono
Deputy Air Pollution Control Officer

Attachment

OTHER INACCURACIES IN APPEAL LETTERS

The letter from California Unions for Reliable Energy (CURE) page 12 states ". . . the contemporaneous operation of the existing MP-I plant and the Project would result in increased emissions of VOCs, which as ozone precursors would contribute to the region's non-attainment status of this pollutant." The first phrase of this sentence is accurate; both plants operating would increase the emissions of VOCs, the conclusion that it would contribute to the region's non-attainment status for ozone (O3) is not valid as discussed in the letter.

CURE letter, page 13, ". . . the Project would result in potentially significant impacts because the Project's rate of operational emission of VOCs, an ozone precursor, exceeds CEQA significance thresholds." California has no threshold of significance, and neither does Great Basin Unified Air Pollution Control District (District). The citation for this statement in the CURE letter is a comment letter to the FEIR. The Comment further states that Mono County has a 55 lb/day threshold and a 250 lb/day threshold, so maybe this comment is best addressed by Mono County since it's their CEQA thresholds.

I8-44 cont.

CURE letter, end of page 13, top of page 14 "In particular, the estimates provided in the EIR fail to include emissions from M1 plant's pressure release valves, and are otherwise unreliable." The 205 pounds per day includes all fugitive VOC emissions for M1, including pressure release valves. Fugitive VOC emissions for all plants at Mammoth Pacific are based on total isobutane (or in the M1 case; pentane) purchased through the year, with some short-term daily variation for pressure and temperature.

Laborers Int'l Union of North America, Local 783 (LIUNA) letter, page 18 of 32, "In particular, the cumulative impact analysis fails to consider ROG emissions from the MP-I facility, the Casa Diablo geothermal complex production pipeline networks and geothermal and reinjection well fields, and the Basalt Canyon Pipeline." The fugitive emissions of Reactive Organic Compounds (ROGs, aka VOCs) from the geothermal plant are limited by permit condition. ROGs are not emitted from the geothermal pipeline (neither production of injection). This is not a "flash" plant, geothermal noncondensable gases are not emitted.

References

CARB, 2001. California Air Resources Board, Assessment of the Impacts of Transported Pollutants on Ozone Concentrations in California, March 2001, http://www.arb.ca.gov/regact/trans01/isor.pdf, website accessed on Nov. 5. 2012.

CARB, 2012. Mono County Emission Inventory for 2008, http://www.arb.ca.gov/ei/maps/statemap/cntymap.htm, website accessed November 5, 2012.

Comments

Of the
California Unions for Reliable Energy

On
Joint Draft Environmental Impact Statement / Environmental Impact Report for ORNI 50 LLC's Casa Diablo IV Geothermal Development Project

Mono County

RECEIVED
JAN 30 2013
GREAT BASIN UNIFIED APCD

Prepared and Submitted
to the
U.S. Bureau of Land Management and the
Great Basin Unified Air Pollution Control District

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January 29, 2013

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Exhibit List

A. Scott Cashen Comment letter
B. Matt Hagemann Comment letter
C. Vern Bleich Comment letter
D. Petra Pless Comment letter
E. Bureau of Land Management, National Environmental Policy Act Handbook, 2009.
F. Excerpts from the MP-1 Replacement Project DEIR, RDEIR, and RDEIR2
G. County of Mono Community Development Department, Mono County General Plan (Drafted July 1997 and Revised 2010) Conservation /Open Space Element
H. Draft Project Management Indicator Species Report: Casa Diablo IV Geothermal Development Project
I. Jim Paulus Letter to S. Kerns RE: Plant communities found at the Basalt Canyon Geothermal Exploration Survey Area 2001
J. Conservation Assessment of Greater Sage-grouse and Sagebrush Habitats Western Association of Fish and Wildlife Agencies
K. USFWS Final Rule Owens tui chub 1985
L. USFWS Owens Tui Chub 5 Year Review and Evaluation 2009
M. Letter from Burke S. Large, Assistant District Counsel, Department of the Army to Pamela N. Epstein, Attorney Adams Broadwell Joseph & Cardozo RE: Freedom of Information Act ("FOIA") request.
N. Bureau of Land Management, Proposed Resource Management Plan and Final Environmental Impact Statement, June 2007, Appendix L, Air Quality Mitigation Matrix
O. U.S. Department of Health and Human Services, Agency for Toxic Substances and Disease Registry, Toxicological Profile for Hydrogen Sulfide, 2006
P. U.S. EPA, Leak detection and Repair Compliance Assistance Guidance, A Best Practice Guide
Q. U.S. EPA, Risk Management Plan Rule Guidance
R. Geothermal Development and Changes in Surficial Features: Examples from the Western United States.
S. Long Valley Hydrologic Advisory Committee Hydrologic Monitoring Data for the Period Ending December 2011.
T. BLM 6840 – Special Status Species Management Manual 2001
U. U.S. EPA Potential Environmental Impacts of Dust Suppressants: Avoiding another Times Beach.
V. United States Department of the Interior, BLM Wildlife: Greater sage-grouse conservation

W. Ormat LLC's Supporting Documentation for MP1-Replacement Project Conditional Use Permit

X. Excerpts (Chapters 1, 4 and 5Inyo Forest LRMP 1988

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January 29, 2013

VIA OVERNIGHT MAIL

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351 Pacu Lane, Suite 100
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Great Basin Unified Air Pollution
Control District
Attn: Jan Sudomier
157 Short Street
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Re: **Comments on the Joint Draft Environmental Impact Statement/ Environmental Impact Report for ORNI 50 LLC's Casa Diablo IV Geothermal Development Project.**

Dear Mr. Reinhardt and Ms. Sudomier:

We are writing on behalf of California Unions for Reliable Energy ("CURE") to provide comments on the Draft Environmental Impact Statement / Environmental Impact Report ("draft EIS/EIR"), prepared jointly by the Bureau of Land Management ("BLM") and the Great Basin Unified Air Pollution Control District ("GBUAPCD" or the "Air District") (referred to jointly, as the "Lead Agencies"), pursuant to the National Environmental Policy Act ("NEPA")[1] and the California Environmental Quality Act ("CEQA"),[2] for the Casa Diablo IV Geothermal Development Project (the "Project"). The Project is a geothermal power plant facility with a net generating capacity of approximately 33 megawatts ("MW"), proposed by ORNI 50 LLC, a subsidiary of Ormat Nevada, Inc (the "Applicant"). The Applicant seeks approval of its Application for Geothermal Drilling, Commercial Use, Site License, and Construction Permit; Plan of Development (POD), Plan of Operation and Plan of Utilization (POU) from the BLM and an Authority to Construct and Permit to Operate from the Air District. The Project will also require a Special Use Permit from the United States Forest Service

I9-1

[1] 42 U.S.C. § 4321 et. seq.
[2] Pub. Resources Code § 21000 et seq.
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("USFS") for new access roads and the transmission line[3], among other permits, some of which have not yet been identified and disclosed to the public. The USFS will rely upon the analysis in this EIS/EIR to determine whether to approve a Special Use Authorization permit for the use of existing roads, construction of new access roads, maintenance of all access roads and construction of the transmission line. It will then issue its own Record of Decision separate from the BLM.

The Project is proposed on National Forest System Lands administered by the USFS, under a BLM Geothermal Lease (CA-11667 and CA 1167A) within the existing Casa Diablo Geothermal Complex. The Project would be located northeast of Highway 395 and State Route 203, approximately 2 miles from the town of Mammoth Lakes and a half mile away from the Shady Rest Park, a campground and recreation area in Mono County, California.[4] The Project would include construction, operation and maintenance of up to 16 geothermal resource wells (a mixture of injection and production wells), associated pipelines and infrastructure; construction of a substation and transmission line; and construction, maintenance and operation, and eventually decommissioning of a power plant.[5] The Project has an operational life expectancy of 30 years.[6]

I9-1 cont.

Currently 40 MW of power is being produced at the Casa Diablo Geothermal Complex from three existing facilities: the Mammoth Pacific I ("MP1"), which commenced operation in 1984 and is producing 10 MW and the PLES I and MP II projects, each commencing operation in 1990 and producing 15 MW.[7] An application to replace the existing MP I power plant with a newer facility ("MP1 Replacement Project") was recently approved by Mono County and would be capable of producing 18.8 MW. With the addition of 33 MW from the proposed Project, the power production in the Casa Diablo Geothermal complex would increase by 83%.

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[3] Draft EIS/EIR, pp. 1-2. The USFS will rely upon the analysis in this EIS/EIR to determine whether to approve a Special Use Authorization permit for the use of existing roads, construction of new access roads, maintenance of all access roads and construction of a the transmission line. It will then issue its own Record of Decision separate from the BLM.

[4] *Ibid.*, at pp. 1-2, 3.2-5.

[5] *Id.*, at pp. 2-4. The EIS/EIR proposes four alternatives to the Proposed Action: Alternative 1, Plant Site Alternative, Alternative 3 Modified Pipeline Alternative, and 4 the No Action Alternative. Alternatives 1-3 include the same project components as described.

[6] *Id*, at p.2-44.

[7] *Id.*, at p. 1-4 (Figure 1-1, Existing Facilities).

Based upon our review of the draft EIS/EIR and pertinent public records in the possession of the lead agencies, as well as other agencies, that we were able to obtain during the public comment period, we conclude that the draft EIS/EIR is inadequate and must be withdrawn. The BLM and the Air District must prepare a revised draft EIS/EIR, which complies with both state and federal environmental laws.

The draft EIS/EIR fails to comply with CEQA and NEPA's most basic requirements for format and content because it does not contain a complete and accurate Project description, fails to provide a legally defensible environmental baseline for biological, water and geothermal resources, and fails to identify the Project's significant impacts on air quality, public health, biological, water and geothermal resources. As a result of these significant shortcomings, as well as the pervasive lack of supporting documentation regarding Project impacts in several resource categories, the draft EIS/EIR fails to identify and mitigate the Project's potentially significant environmental impacts. These defects render the draft EIS/EIR inadequate as an informational document.[8] I9-2

We have prepared these comments with the assistance of technical experts Mr. Scott Cashen, M.S. biologist, Mr. Matt Hagemann, P.G. C.Hg, Mr. Vern Bleich, senior biologist specializing in large mammals, and Dr. Petra Pless. Their comments to the BLM on the Draft EIS/EIR and curriculum vitae are attached as Attachments A – D, respectively. Please note these experts' comments are submitted to the BLM and must be responded to separately.

I. STATEMENT OF INTEREST

CURE supports the development of clean, renewable energy technology, including the use of geothermal power generation, where properly analyzed and carefully planned to minimize impacts on the environment. Geothermal and mineral extraction projects should avoid impacts to sensitive species and habitats, water land air resources, and public health, among others, and should take all feasible steps to ensure that unavoidable impacts are mitigated to the maximum extent feasible. Only by maintaining the highest standards in these and other ways can energy supply development be truly sustainable. I9-3

[8] We reserve the right to supplement these comments at any later hearings and proceedings related to this Project. *See, Galante Vineyards v. Monterey Water Dist.* (1997) 60 Cal. App. 4th 1109.

CURE and is members are concerned about project that can result in serious environmental harm without providing countervailing economic benefits such as decent wages and benefits. Both NEPA and CEQA provide a balancing process whereby economic benefits are weighed against significant impacts on the environment.[9] Environmentally detrimental projects can jeopardize future jobs by making it more difficult and more expensive for industry to expand in Mono County, and by making it less desirable for businesses to locate and people to live and recreate in the County, including the Project vicinity. Continued degradation can, and has, caused construction moratoriums and other restrictions on growth that, in turn, reduces future employment opportunities. I9-3 cont'd

CURE's members live, work, recreate and raise their families in Mono County, including in and around Mammoth Lakes. Accordingly, CURE's members would be directly affected by the Project's adverse environmental impacts. CURE's members may also work on the Project itself. They will, therefore, be the first in line to be exposed to any hazardous materials, air contaminants, and other health and safety hazards that exist onsite.

II. THE DRAFT EIS/EIR FAILS TO SATISFY CEQA AND NEPA'S PURPOSES AND GOALS FOR AN EIS/EIR TO SERVE AS AN INFORMATIONAL DOCUMENT.

I9-4

The environmental review process is "the principal method by which environmental data are brought to the attention of the agency and the public."[10] The draft EIS/EIR therefore has two key functions: to identify and describe every significant impact of a project and to propose feasible mitigation for each impact, if such mitigation exists.[11] As such it serves as an informational document.[12] The draft EIS/EIR provides the public with the ability to review and comment on the

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[9] 40 C.F.R. § 2508.14; Cal. Pub. Res. Code § 21081(a)(3); Cal. Code Regs (hereinafter CEQA Guidelines) § 15131; *Citizens for Sensible Development of Bishop Area v. County of Inyo* (1985) 172 Cal.App.3d 151, 171.

[10] *Mira Monte Homeowners Ass'n v. County of Ventura* (1985) 165 Cal.App.3d 357, 365.

[11] Cal. Pub. Res. Code §§ 21002.1, 21100(a); 40 C.F.R. § 1502.14(f); *see also, Sierra Club v. State Board of Forestry* (1994) 7 Cal.4th 1215, 1229; *County of Inyo v. City of Los Angeles* (1977) 71 Cal.App.3d 185, 192; *Robertson*, 490 U.S. at pp. 348-352; *Sierra Club v. Marsh*, 976 F.2d 763, 767 (1st Cir. 1992).

[12] 40 C.F.R. § 1502.1; *see also, Laurel Heights Improvement Ass'n v. Regents of the University of California* ("*Laurel Heights I*") (1988) 47 Cal.3d 376, 392.

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impacts and proposed mitigation measures, and provides the agency with a basis for making findings to support its decision on the project.[13]

Analyzing the project's impacts is meant to be an interactive process between the public and the lead agencies. For that reason, the process "must be open to the public, premised upon a full and meaningful disclosure of the scope, purposes, and effect of a consistently described project, with flexibility to respond to unforeseen insights that emerge from the process."[14] "The ultimate decision of whether to approve a project be that decision right or wrong, is a nullity if based upon an EIR that does not provide the decision-makers, and the public with the information about the project that is required by CEQA."[15]

Under CEQA, an EIR has been expressed as "an environmental 'alarm bell' whose purpose it is to alert the public and its responsible officials to environmental changes before they have reached ecological points of no return."[16] CEQA "contemplates serious and not superficial or pro forma consideration of the potential environmental consequences of a project."[17] "Conclusory comments in support of environmental conclusions are generally inappropriate."[18] "To facilitate CEQA's informational role, the EIR must contain facts and analysis, not just the agency's bare conclusions or opinions."[19]

I9-4 cont'd

CEQA ensures lead agencies thoroughly investigate potential project impacts.[20] The agency "must use its best efforts to find out and disclose all that it reasonably can."[21] Even if it is not feasible to do sophisticated technical analyses of impacts, the lead agency must perform less exacting analyses and report the

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[13] 40 C.F.R § 1502.1; *see also, Sierra Club*, 7 Cal.4th at p. 1229; *Robertson* 490 U.S. at p. 349; *Adler v. Lewis* (9th Cir. 1992) 675 F.2d 1085, 1096.
[14] *County of Inyo v. City of Los Angeles* (1984) 160 Cal.App.3d 1178, 1185.
[15] *Santiago County Water Dist. v. County of Rrange* (1981) Cal.App.3d 818, 829.
[16] *County of Inyo v. Yorty, supra*, 32 Cal.App.3d 795, p. 810.
[17] *Leonoff v. Monterey County Bd. of Supervisors* (1990) 222 Cal.App.3d 1337, 1347-48.
[18] *Laurel Heights I*, 47 Cal.3d at p. 404; *see also Seattle Audubon Society v. Moseley* (W.D. Wash. 1992) 798 F.Supp. 1473, 1479, quoting *Silva v. Lynn* (1st Cir. 1973) 482 F.2d 1282, 1285.
[19] *Laurel Heights I*, 47 Cal.3d at p. 404, quoting *Concerned Citizens of Costa Mesa v. 32nd Agricultural Ass'n* (1986) 42 Cal.3d 929, 935; *see also Robertson*, 490 U.S. at p. 349; Adler *v. Lewis* (9th Cir. 1992) 675 F.2d 1085, 1096.
[20] *Seattle Audubon*, 798 F.Supp. at pp. 1479, 1482.
[21] CEQA Guidelines § 15144.

results.[22] The finding proffered by the agency in the EIR must be based on substantial evidence in the record.

Similarly, under NEPA, the EIS serves as a means of assessing "the environmental impact of proposed agency actions, rather than justifying decisions already made."[23] As such, an EIS is more than just a disclosure device; it is an "action-forcing device" which ensures that NEPA's requirements are infused into the ongoing programs and actions of the federal government.[24] For that reason, a "lack of knowledge does not excuse the preparation of an EIS; rather it requires [the agency] to do the necessary work to obtain it."[25]

To fulfill these functions, the discussion of impacts in an EIS should be concise, clear, to the point, and supported by evidence that the agency has made the necessary environmental analyses."[26] It is only through a concise and clear EIS that is supported by evidence that federal agencies are informed of environmental consequences ***before*** making decisions and that the information is available to the public.[27] As the Council on Environmental Quality ("CEQ") explains in its regulations, "[e]nvironmental impact statements shall serve as the means of assessing the environmental impact of proposed agency actions, rather than justifying decisions already made."[28]

I9-4 cont'd

In addition to a scientifically defensible analysis of project impacts, an EIS must also include a discussion of "appropriate mitigation measures not already included in the proposed action or alternatives."[29] An EIS is not complete unless it contains "a reasonably complete discussion of possible mitigation measures."[30] Mitigation includes "avoiding the impact altogether by not taking a certain action or parts of an action."[31] It also includes "minimizing impacts by limiting the degree or magnitude of the action and its implementation."[32] The mandate to thoroughly

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[22] *Citizens to Preserve the Ojai v. County of Ventura* (1985) 176 Cal.App.3d 421, 432
[23] 40 C.F.R. § 1502.2(g).
[24] 40 C.F.R. § 1502.1.
[25] *National Parks & Conservation Association v. Babbitt*, 241 F.3d 722, 733 (9th Cir. 2001), *abrogated on other grounds by Monsanto Co. v. Geertson Seed Farms*, 2010 WL 2471057, (2010).
[26] *Id.*
[27] *Inland Empire Pub. Lands Council v. U.S. Forest Serv.*, 88 F.3d 754, 758 (9th Cir. 1996).
[28] 40 C.F.R. § 1502.2(g).
[29] 40 C.F.R. § 1502.14(f).
[30] *Robertson v. Methow Valley Citizens Council*, 490 U.S. 332, 352 (1989).
[31] 40 C.F.R. § 1508.20(a).
[32] *Id.* at subd. (b).
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evaluate all feasible mitigation measures is critical to NEPA's purposes.[33] Hence, a "perfunctory description" or a "mere listing" of possible mitigation measures is not adequate to satisfy NEPA's requirements.[34] That individual harms are somewhat uncertain due to limited understanding of the Project characteristics and baseline conditions does not relieve BLM of the responsibility under NEPA to discuss mitigation of reasonably likely impacts at the outset.[35]

I9-4 cont'd

Both statutes place the burden of this environmental investigation on the government rather than the public.[36] An agency is not allowed to "hide behind its own failure to gather relevant data."[37]

As will be discussed, the draft EIS/EIR for the proposed Project fails to comply with both NEPA and CEQA's basic requirements to act as an informational document. The EIS/EIR is rife with technical errors and significant informational gaps in the Lead Agencies' analyses that preclude meaningful public review and informed decision-making. Further failing as an information document, the draft EIS/EIR does not adequately describe or properly mitigate impacts to most environmental resources. The draft EIS/EIR fails to establish the Project's environmental setting, does not fully and fairly describe the proposed action in its project description, wholly omits a discussion of a number of potentially significant environmental impacts, and fails to adequately mitigate the Project's significant adverse impacts. The result of these failures is that the conclusions reached by the draft EIS/EIR are unsupported. As demonstrated by this comment letter, the draft EIS/EIR must be revised to fully describe the Project's environmental setting, impacts and mitigation. Once the draft EIS/EIR's inadequacies are addressed, a revised draft EIS/EIR must be re-circulated for public review and comment, as required by both NEPA and CEQA.

I9-5

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[33] *Id.* at § 1500.1(c).
[34] *Neighbors of Cuddy Mountain*, 137 F.3d at 1380; *Idaho Sporting Cong. v. Thomas*, 137 F.3d 1146, 1151 (9th Cir. 1998).
[35] *See South Fork Band Council of Western Shoshone of Nevada*, 588 F.3d at 727, citing *National Parks*, 241 F.3d at 733.
[36] *Sundstrom v. Mendocino County* (1988) 202 Cal.App.3d 296, 311.
[37] *Id.*; *see also* p. 361 (sparseness of record suggests existence of significant issues); *see also* 40 C.F.R. § 1502.22.
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III. THE EIS/EIR VIOLATES NEPA AND CEQA BY FAILING TO PROVIDE AN ACCURATE, STABLE AND CONSISTENT PROJECT DESCRIPTION.

The draft EIS/EIR does not meet either NEPA or CEQA's requirements because it fails to include a complete and accurate Project description, rending the entire analysis inadequate. An accurate, complete and consistent project description is necessary for public and decision makers to understand the effects of the proposed action and its alternatives.[38] By contrast, an inaccurate or incomplete project description renders the analysis of environmental impacts inherently unreliable. Without a complete project description, the environmental analysis under CEQA and NEPA will be impermissibly narrowed, thus minimizing the project's impacts and undercutting public review.[39] I9-6

A. The Incomplete Project Description Contained in the EIS/EIR Violates State and Federal Law.

An accurate, complete and consistent project description is necessary for the public and decision makers to understand the effects of the proposed action and its alternatives.[40] "A clear description results in more focused and meaningful public input and [Air District and] BLM participation, a more complete identification of issues, development of reasonable alternatives, sound analysis and interpretation of effects, focused analysis and a sound and supportable decision."[41] "Only through an accurate view of the project may affected outsiders and public decision-makers balance the proposal's benefit against its environmental cost ....".[42]

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[38] *See*, 40 C.F.R. §§ 1502.4, 1502.15; *see also Laguna Greenbelt v. U.S. Dept. of Transportation* (1994) 42 F.3d 517, 528-29 (reviewing plaintiff's claim that inconsistent definition resulted in misleading analysis of project's positive and negative effects); *see also, State of Cal. v. Black*, 690 F.2d 753, 761 (9th Cir. 1982) (starting point for analysis whether a "critical decision" with respect to site development is "to describe accurately the 'federal action' being taken").

[39] *See, e.g., Laurel Heights I* at p. 376.

[40] *See* 40 C.F.R. §§ 1502.4, 1502.15; *see also Laguna Greenbelt v. U.S. Dept. of Transportation* (1994) 42 F.3d 517, 528-29 (reviewing plaintiff's claim that inconsistent definition resulted in misleading analysis of project's positive and negative effects).

[41] Bureau of Land Management, National Environmental Policy Act Handbook, Jan. 2008, p. 43 (hereafter, "BLM NEPA Handbook") (Attachment E); *see also, County of Inyo v. City of Los Angeles* (1977) 71 Cal.App.3d 185, 192-93.

[42] *County of Inyo v. City of Los Angeles, supra*, 71 Cal.App.3d at 193.

The courts interpreting CEQA have repeatedly held that "[a]n accurate, stable and finite project description is the *sine qua non* of an informative and legally sufficient EIR."[43] Similarly, courts applying NEPA have held that "[w]here the information in the initial EIS was so incomplete or misleading that the decision maker and the public could not make an informed comparison of the alternatives, revision of an EIS [was] necessary to provide a reasonable, good faith, and objective presentation of the subjects required by NEPA."[44]

A legally compliant EIS must also address closely related "connected actions," as well as similar actions and cumulative actions.[45] Under NEPA, actions are connected if they:

(i) Automatically trigger other actions, which may require environmental impact statements.
(ii) Cannot or will not proceed unless other actions are taken previously or simultaneously.
(iii) Are interdependent parts of a larger action and depend on the larger action for their justification.[46]

I9-6 cont'd

The draft EIS/EIR at issue contains a cryptic and extremely generalized description of the power plant's phased construction and various project components. Because the draft EIS/EIR fails to identify and analyze impacts related to key Project components and connected actions it lacks foundation for its conclusions regarding Project impacts. Moreover, it renders public comment and review meaningless since the public is not provided the basic information about the Project necessary to assess potential impacts. The BLM and the Air District must revise and re-circulate a new draft EIS/EIR containing a complete and accurate project description and analysis of project impacts.

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[43] *Ibid.*
[44] *Natural Resources Defense Council v. U.S. Forest Service* (9th Cir. 2005) 421 F.3d 797, 811 (citing *Animal Defense Council v. Hodel* (9th Cir. 1988) 840 F.2d 1432, 1439).
[45] 40 CFR §1508.25(a).
[46] 40 C.F.R. §1508.25(a)(1).
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1. Failure to Describe Phasing and Operation of the Power Plant

The Draft EIS/EIR fails to describe the Project's proposed wellfield expansion for each phase of the Project. This failure to disclose, analyze and mitigate the wellfield expansion renders the entire document incomplete. The Lead Agencies must either describe the well field development for each phase or assume the entire wellfield will be developed in Phase I, and provide an assessment of geothermal resource extraction, road development, and other associated impacts in a revised draft EIS/EIR accordingly.

The draft EIS/EIR reveals that the Applicant may rely, in part, on existing wells within the geothermal complex to generate the necessary flow output, explaining that the "power plant would be operated collectively with the existing Casa Diablo Geothermal Complex."[47] If the Project would draw the necessary operational flow from existing wells, a fundamental contradiction emerges with the assumptions relied upon in the MP-1 Replacement Project EIR. The analysis in the MP-1 Replacement Project EIR was predicated on an assumption that brine pumping could not be increased at the Casa Diablo Geothermal Complex without further wellfield expansion.[48] The draft EIS/EIR must resolve this potential contradiction. The draft EIS/EIR must accurately account for the maximum potential increase in geothermal resource extraction both before and after the wellfield is expanded as a result of the Project, including any associated impacts. I9-7

The Draft EIS/EIR explains that the Project will have a total net generating capacity of 33 MW from a binary power plant. The power plant will be constructed in two phases, each with one independent Ormat Energy Converter ("OEC").[49] From the EIS/EIR, it appears that the first OEC unit will be able to reach its full commercial capacity of 21.5 MW upon its completion in Phase I.[50] The draft EIS/EIR only "*assumes* that sufficient flow would be obtained to operate one OEC system in Phase I."[51] The draft EIS/EIR does not describe whether this "sufficient flow" would be achieved with or without new wells. The draft EIS/EIR does indicate that only Phase II will not be developed until "after the well field is further

[47] *Id.* at 2-44.
[48] Environmental Impact Report for Mammoth Pacific Replacement 1 (excerpts Attachment F).
[49] Draft EIS/EIR, pp. 2-11 and 2-38.
[50] *Id.*, at p. 2-11.
[51] *Ibid.*
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developed.[52] The Project proposes an expansion to the existing wellfield through the addition of up to 16 geothermal wells sites at 18 possible locations.[53] The exact number of wells will depend on the production capacity of the individual well sites.[54] This uncertainty becomes increasingly problematic as the draft EIS/EIR states there *could be* up to six wells available for the Phase I OEC.[55] Of the *possible* six wells, it is *unknown* whether some, all or potentially, *none* could be used for geothermal production.[56] Given this amorphous backdrop, it is reasonably foreseeable that sufficient flow may not exist at the time the Phase I OEC unit is developed.

I9-7 cont'd

The draft EIS/EIR's failure to identify and address how the Project will maintain full commercial generating capacity of the Phase I OEC, given the uncertainty surrounding the production capacity of existing and expanded wellfield is a fatal omission. The draft EIS/EIR must be revised to include the information regarding the power plant's phased construction and geothermal availability in order to meaningfully assess the Project's impacts to sensitive biological resources, air quality, and water quality amongst others.

2. Failure to Adequately Describe the Project's Roadways.

The EIS/EIR states that an estimated 5.8 miles of existing roads, which include County-maintained roads, National Forest Service Roads ("NFSR") and unauthorized user-created roads will be "improved" to provide access to the wellfield.[57] Approximately 0.61 miles of unauthorized new roads will also be created.[58] The draft EIS/EIR however, fails to explain the type of improvements that will be made and whether the roads will be paved, unpaved, gravel, or otherwise. The type of roads improvements undertaken, as well as the type of roads created, could and most likely will involve additional site grading and varying construction vehicle emissions, translating in additional impacts not yet addressed. The failure to describe these Project components renders the impact analysis in the EIS/EIR inaccurate and incomplete.

I9-8

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[52] *Id.*
[53] *Id.*
[54] *Id.*
[55] *Id.*
[56] *Id.*
[57] Draft EIS/EIR p. 2-18.
[58] *Ibid.*

The new and improved roads are a connected action under NEPA, significant and part of the Project that must be analyzed. The new and improved roads trigger the need for a Special Use Authorization permit ("SUA permit") from the USFS. While the USFS will issue its own Record of Decision for the SUA permit, the USFS will "use this analysis [EIS] to decide whether to approve the Special Use Authorization permit."[59] Given the USFS clear intention not to engage in future environmental review, it is monumentally important for the draft EIS/EIR to contain a fully articulated description and analysis of the roads in order to identify, analyze and mitigate potential impacts.

I9-8 cont'd

3. Failure to Provide an Adequate Description of the Project Drainage Features.

The draft EIS/EIR simply states,

> [s]ite drainage, including finish grades, ditches, swales, and other drainage features, would be designed to meet local weather conditions and appropriate engineering standards. The drainage would be designed to ensure that stormwater runoff would not adversely affect nearby surface waters and would not cause erosion. The plant and well pads would be designed so that spills would be contained on site.[60]

I9-9

The draft EIS/EIR contains no description or details of the proposed drainages or any analysis of the potentially associated significant impacts. The draft EIS/EIR then exclusively relies on a non-existent "site-specific drainage and runoff management plan" to be drafted later by the Applicant.[61] Without any design information there is no way for the public or decision makers to evaluate whether the drainages would be able to accomplish the objective of "not adversely affect[ing] nearby surface waters and would not cause erosion."[62] Furthermore, without details of the erosion control measures to be installed on Project roads and the design of stream crossings it is impossible to determine whether the Project is in compliance with Mammoth Lake General Plan Policy R.2.D that prohibits placing intermittent streams in culverts and numerous other state and federal law governing waterways.[63]

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[59] *Id.*, p. 1-2.
[60] Draft EIS/EIR, p. 2-8.
[61] *Id.*, p. 4.17 (*see*, PDM HYD-5).
[62] *Ibid.*
[63] *Id.* p. 3.3-25.

Because the draft EIS/EIR failed to include this indispensible information regarding project drainage features and erosion control measures, the significance of the Project's impacts to biological resources and water quality, among other resources, cannot be accurately ascertained.[64]

I9-9 cont'd

4. Failure to Describe the Project's Parking Areas.

The draft EIS/EIR contains a less than meaningful description of the Project's parking areas for construction. This is important to evaluate impacts. Water trucks, utility vehicles, haul trucks and workers' vehicles will all be on the site during Project construction.[65] Approximately 64 trucks will haul material to the Project site per day, accounting for well drilling, power plant and pipeline construction.[66] In addition, approximately 170 workers will commute to the Project site during the peak of construction.[67] However, the draft EIS/EIR provides virtually no information regarding where these vehicles will park other than to say that "[p]roject vehicles will not block Sawmill Road or Sawmill Cutoff Road...".[68] The Lead Agencies must specify where construction vehicles will be parked so that decision makers and the public can assess the Project's impacts.

I9-10

5. Failure to Describe the Project's Water Demand for Fire Suppression.

The draft EIS/EIR completely fails to describe the amount of water the Project will need to maintain onsite for fire protection. The draft EIS/EIR does not provide any information regarding where the onsite water storage tank will be located or what constitutes a "fire suppression system."[69] The Lead Agencies must

I9-11

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[64] *See*, Letter from Scott Cashen, to BLM and Air District (Jan. 28, 2013), pp. 7 and 21 (hereafter "Cashen Comments") (Attachment A); *see also*, Letter from Matt Hagemann, BLM and Air District (Jan. 8. 2013) pp. 8-9 (hereinafter "Hagemann Comments") (Attachment B).

[65] Draft EIS/EIR e.g., pp., 4.16-3 and 4.16-4; *see also* Table 4.16 and p. 4.13-20 "...an adequate number [and size] of water trucks equipped with 50 feet of fast response hose with fog nozzles, be onsite during construction for immediate response to fire incidents."

[66] *Id.*, at p. 4.16-3.

[67] *Ibid.* This number is per phase and accounts for well drilling/construction, power plant and pipeline. The approximate number of generated vehicle roundtrips for the Project, accounting for material trucks, commuter and "miscellaneous midday" trips, is 277 per day.

[68] *Id*, at p., 4.16-5.

[69] *Id.* at p. 4.13-9 stating that a fire suppression system, a water storage tank and pump, and automatic emergency shutdown systems will ensure the safe operation of the facility.

disclose whether the USFS will require additional facilities to store water onsite for fire suppression. If additional water is required to be stored onsite, the Lead Agencies must also disclose how much water is needed, who will supply it, and where it will be stored. Without providing the necessary details, there is no way for the public or decision-makers to analyze the impacts. I9-11 cont'd

6. Failure to Identify the Project's Operational Water Demand.

In *Vineyard Area Citizens for Responsible Growth v. City of Rancho Cordova*, the California Supreme Court held that an EIR fails to meet CEQA's purpose and goals if it fails to address a project's water supply with a sufficient degree of certainty to allow decision makers to "evaluate the pros and cons of supplying the amount of water that the project will need."[70] An EIR must provide information regarding the plan, and the construction necessary, to supply water to a project.[71] This information is necessary to determine the environmental impacts of supplying the project with its required amount of water.[72] The DEIR fails to identify the Project's operational water demand. This omission alone renders the draft EIS/EIR inadequate under CEQA. I9-12

B. The Failure of the EIS/EIR to Consider the *Whole of the Action* is a Fundamental Flaw Under CEQA.

CEQA defines a "project" broadly to encompass the "whole of an action."[73] As the Guidelines state, "the term 'project' has been interpreted to mean far more than the ordinary dictionary definition of the term."[74] Any activity "which may cause either a direct physical change in the environment, or a reasonably foreseeable indirect physical change in the environment" constitutes a "project" or the "whole of the action."[75] This includes, but is not limited to, "later phases of the project, and any secondary, support, or off-site features necessary for its implementation."[76] I9-13

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[70] *Vineyard Area Citizens for Responsible Growth, Inc. v. City of Rancho Cordova* (2007) 40 Cal.4th 412, 430-31 *citing Santiago County Water Dist. v. County of Orange* (1981) 118 Cal.App.3d at 829.
[71] *See Id.* at pp. 829-830.
[72] *Ibid.*
[73] Pub. Resources Code, §§ 21065, 21080, subd. (a); CEQA Guidelines, §§ 15002, subd. (d), 15003, subd. (h), 15165, 15378, Appendix G.
[74] CEQA Guidelines, § 15002, subd. (d).
[75] Pub. Resources Code, § 21065.
[76] CEQA Guidelines, Appendix G.
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1. The Draft EIS/EIR Improperly Excludes a Complete Description of the Whole of the Action by Failing to Adequately Describe the Project's Decommissioning Activities.

A complete, stable project description is necessary to ensure informed decision making and meaningful public comment.[77] Here the draft EIS/EIR fails to comply with the law by providing an incomplete and inconsistent description of the Project's decommissioning and site restoration activities. The draft EIS/EIR recognizes the Project has three phases: construction, operation and maintenance and *decommissioning,* and that the final phase, decommissioning, will occur at the end of the Project's 30-year operational life span.[78]

While the construction and operation and maintenance phases are described over the course of several pages, the Project's decommissioning description is relegated to few paragraphs in which the draft EIR/EIS states decommission would involve dismantling of the power plant and wellfield, removal of associated infrastructure and grading site to "approximate pre-project land use."[79] The draft EIS/EIR is absent any specific details with regarding to decommissioning electing to instead reference a "Site Abandonment-Reclamation Plan that would describe the proposed equipment dismantling and site restoration program."[80] The draft EIS/EIR is unclear when such a plan would even be prepared; indicating in one instance that the plan would be prepared prior to operation of the Project and, in another, stating preparation would be reserved until the end of the power plant operations.[81] The only constant element of the plan is that it is not included or evaluated as part of the draft EIS/EIR.

The BLM and Air District's failure to include the decommissioning phase of the Project in the draft EIS/EIR is impermissible. The courts have held that a reclamation plan is "simply the final phase of the overall usage of the land" and must be considered with the construction and operational phases.[82] The draft EIS/EIR's cursory treatment of the third phase of the Project is in clear contravention of CEQA's mandate for describing the "whole of the action" which is being approved.

I9-13 cont'd

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[77] *Dry Creek Citizens Coalition v. County of Tulare* (1999) 70 Cal.App.4th 20, 26.
[78] Draft EIS/EIR, p. 2-44.
[79] *Ibid.*
[80] *Id.*, at p. 2-45.
[81] *Id.*, at pp. 2-45, 4.3-8, 4.8-6.
[82] *Nelson v. County of Kern* (2010) 190 Cal.App.4th 252, 272.
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The decommissioning impact analysis is further curtailed by the draft EIS/EIR's baseless assumption applied to nearly all impacted resources areas that decommissioning will result in the same or lesser impacts than construction.[83] This statement is incorrect and pure conjecture. For example, impacts to biological resources, such as special-status plant and animal species, could be significant as species can colonize or re-colonize the Project site during the three decades of Project operation.[84] Furthermore, the blanket statement that the reclamation plan will conform to the BLM's requirements for geothermal well abandonment is not a substitute for an examination of potentially significant impacts associated with decommissioning.[85] The courts have held such generalized compliance with an agency's regulatory scheme is not an acceptable replacement for analyzing a project's specific environmental consequences.[86]

I9-13 cont'd

Decision makers and the public have this, and only this, opportunity to review the environmental impacts associated with decommissioning and site restoration. There is no future discretionary permit or review period that would enable decision makers to analyze potentially significant impacts for decommissioning on the environment. The public and decision makers would only be left to hope that decommissioning impacts would not pose a risk to the environment or human health or safety. Approving a project with the hope that it will not impact the environment clearly violates CEQA and NEPA. Without a proper and consistent description of decommissioning and restoration activities, the project description in the draft EIS/EIR is inadequate as a matter of law.

For all the reasons given in this section, the project description in the draft EIS/EIR is incomplete. The BLM and the Air District must obtain a complete Project description from the applicant and include that information and a revised analysis in a new draft EIS/EIR. The draft EIS/EIR must be revised and re-circulated to correct these deficiencies.

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[83] *See, e.g.* Draft EIS/EIR, pp. 4.2-14, 4.3-10 and 17, 4.4-8, 4.6-14-15, 4.8-7, 4.10-5, 4.11-11, and 4.16-8.

[84] Cashen Comments, p. 10.

[85] Draft EIS/EIR, p. 2-44.

[86] *Californians for Alternatives to Toxics v. Dept. of Food and Agriculture* (2005) 136 Cal.App.4th 1, 16.

IV. THE EIS/R FAILS TO PROVIDE AN ADEQUATE DESCRIPTION OF THE ENVIRONMENTAL SETTING.[87]

The draft EIS/EIR improperly relies on an inaccurate and incomplete description of existing conditions, which artificially skews the impact analysis. An accurate description of the affected environment is essential because it establishes the baseline physical conditions against which a lead agency can determine whether an impact is significant. Once a project begins, the "pre-project environment" becomes a thing of the past, thereby making evaluation of the project's effect on pre-project resources impossible.[88] The BLM's and Air District's failure to adequately describe the existing setting contravenes the fundamental purpose of the environmental review process, which is to determine whether there is a potentially substantial, adverse change compared to the existing setting.

CEQA and NEPA require the Lead Agencies to include a description of the physical environmental conditions in the vicinity of a project, as they exist at the time environmental review commences.[89] The draft EIS/EIR must describe the existing environmental setting in sufficient detail to enable a proper analysis of project impacts.[90] The draft EIS/EIR fails on both accounts. I9-14

The Lead Agencies must describe "the present condition of the affected resources within the identified geographic scope" and provide "a baseline for cumulative effects analysis."[91] An accurate description of the affected environment is an essential prerequisite for an adequate analysis of Project impacts. For example, information on the type(s) and level(s) of habitat in the Project area is necessary to make inferences about the presence, abundance, and distribution of the special-status species that may be impacted by the Project. Here, however, some baseline information was incorrectly collected and, in some instances, is ***yet to be collected***. Without establishing the baseline conditions which exist in the vicinity of the proposed Project before it is built, there is simply no way to determine what

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[87] For purposes of this comment letter "environmental setting" refers both to the baseline or "existing conditions" under CEQA and the "affected environment" under NEPA.
[88] *Half Moon Bay Fishermans' Marketing Ass'n v. Carlucci* 857 F.2d 505, 510 (9th Cir. 1988), citing *LaFlamme v. FERC,* 842 F.2d 1063, 1071 (9th Cir. 1988).
[89] CEQA Guidelines, § 15125, subd. (a); *see also Communities For A Better Environment v. South Coast Air Quality Management Dist.* (2010) 48 Cal.4th 310, 321; *see also,* 40 C.F.R. § 1502.15.
[90] *Galante Vineyards v. Monterey Peninsula Water Management District* (1997) 60 Cal.App.4th 1109, 1121-22.
[91] *Ibid.*
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effect the proposed geothermal facility will have on the environment and, consequently, no way to comply with NEPA or CEQA.[92]

I9-14 cont'd

A. The EIS/EIR Fails to Adequately Describe Existing Biological Resources.

The draft EIS/EIR fails to accurately and adequately describe the existing biological resources in the Project Area. Without an accurate description of the affected environment, there is no way to determine the Project's impacts to biological resources and, therefore, no way to apply appropriate mitigation for those impacts. To comply with NEPA and CEQA, the draft EIS/EIR must be revised to include accurate and complete descriptions of existing conditions.

1. The Draft EIS/EIR Fails to Provide an Adequate Baseline for Analysis of Mule Deer Impacts.

The Lead Agencies are required to demonstrate that "the significant environmental impacts of the proposed project were adequately investigated and discussed" and that "the significant effects of the project [are] considered in the full environmental context."[93]

I9-15

The draft EIS/EIR fails to exhibit the requisite level of investigation with respect to the mule deer, in the Project Area. The mule deer is an important game species. Geothermal developments on the Round Valley and Casa Diablo deer herds have been a longstanding management concern of both the California Department of Fish and Wildlife ("CDFW") and Mono County.[94] Mule deer are well known for their migratory behavior, a phenomenon that occurs on a semi-annual basis in the fall and spring.[95] The draft EIS/EIR acknowledges that the Project is located in an important mule deer migration path and staging area.[96] However, its discussion of migratory deer use was derived exclusively from migratory studies conducted for

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92 *Half Moon Bay Fishermans' Marketing Ass'n v. Carlucci* 857 F.2d 505, 510 (9th Cir. 1988), citing *LaFlamme v. FERC*, 842 F.2d 1063, 1071 (9th Cir. 1988).
93 *Berkeley Keep Jets Over the Bay Comm. v. Board of Port Comm.* (2001) 91 Cal.App.4th at 1367.
94 Letter from Vern Bleich, to Pamela N. Epstein, Attorney, Adams Broadwell Joseph & Cardozo (Jan. 14, 2013), p. 2 (hereafter "Bleich Comments") (Attachment C) Note that prior to of January 1, 2013, the California Department of Fish and Wildlife was known and referred to as the California Department of Fish and Game ("CDFG").
95 *Id.*
96 Draft EIS/EIR, p. 3.4-1.
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the Project site by the Applicant's consultant during only one migratory period – Fall 2011.[97]

Wildlife biologist Vernon Bleich reviewed the draft EIS/EIR and the consultant's relevant studies. Bleich's comments raise serious concerns regarding the limited duration and scope of the surveys conducted.[98] According, to Bleich the assumption that Project impacts would be identical during both the spring and fall migratory periods is speculative at best and patently wrong, at worst.[99] Unrebutted substantial evidence shows there is the high potential for inter-annual variation in migration routes.[100] The necessity to evaluate both migratory seasons, particularly during spring, is echoed by the CDFW's recommendation for a "thorough site-specific study for mule deer (*Odocoileus hemionus ssp, hemionus)* conducted during the appropriate time of year (April 15 – June 15) by a qualified biologist."[101] Despite CDFW's recommendation, the Applicant declined to do so.

I9-15 cont'd

The draft EIS/EIR further deceives the public by mischaracterizing the evidence on which it relies. The mule deer studies conducted by the Applicant's consultant do not support the conclusions made in the draft EIS/EIR.[102] CEQA requires that an agency's conclusions be supported by evidence, defining substantial evidence as "facts, reasonable assumptions predicated upon facts, and expert opinion supported by facts."[103] Expert analysis that lacks adequate foundation does not constitute substantial evidence for the purpose of CEQA.[104] Here, consultant's studies lack adequate foundation, and therefore, are incapable of serving as substantial evidence. Specifically, Bleich remarks that the surveys omit the statistical methods that were used to answer the objectives of the studies, lack an adequate description of the study methodology, fail to disclose highly relevant information regarding current deer migration patterns, fail to examine deer

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[97] *Ibid.*
[98] *See,* Bleich Comments, section A.
[99] *Id.* 3.
[100] *Id.* at p.2-3.
[101] Letter from Steve Paramenter (for Brad Henderson) to Great Basin Unified Air Pollution Control District, Jan Sudomier re Scoping Comments on CDIV Geothermal Development Project dated May 2, 2011 (on file with the BLM and the Air District).
[102] Bleich Comments, p. 3.
[103] Pub. Resources Code § 21082.2 subd. (c).
[104] *See Lucas Valley Homeowners Association v. County of Marin* (1991) 233 Cal.App.3d 130,157.
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use of the Project impact area during the spring, and contain numerous other deficiencies which render them scientifically unreliable.[105] The biological report itself reinforces Bleich's conclusion, cautioning that, "[g]iven the limited sampling duration, which encompasses a single migration event, the degree to which these results may be generalized to future years or regarded as describing "average use" cannot be known." [106] In addition, the report recognized shortcomings associated with assessing deer migration use during the unusually late snow conditions.[107]

While much of the proposed Project site falls outside of the jurisdiction of the city of Mammoth Lakes in Mono County, the revised Mono County General Plan depicts the Project area as being entirely within the Hot Creek Deer Migration Zone.[108] The Mono County General Plan states:

> "[p]rojects outside community areas within identified deer habitat areas, including migration corridors or winter range (see the Biological Resources Section of the Master Environmental Assessment), which may have a significant effect on deer resources shall submit a site-specific deer study performed by a recognized and experienced deer biologist in accordance with Action 1.1."[109]

As detailed, the "site-specific deer" studies (both resident and migratory) fail to comport with the revised General Plan. First, the studies fail to adequately assess the potential impacts of the proposed project on mule deer. Second, the Applicant's expert, Jim Paulus is not a "recognized and experienced deer biologist." Mr. Paulus is a recognized botanical consultant. As Bleich explains, in order to be recognized as an "experienced deer biologist", the scientific community requires topical professional publications, which Paulus does not possess.[110]

I9-15 cont'd

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[105] Bleich Comments, p. 3.
[106] Paulus, J. 2012. Fall 2011 migratory deer survey for the Casa Diablo, Basalt Canyon, and upper Basalt geothermal areas(.
[107] Paulus 2012 Fall Migratory Deer Survey for the Casa Diablo, Basalt Canyon and Upper Basalt Geothermal Areas.
[108] Draft EIS/EIR pp, 1-5; County of Mono Community Development Department. Mono County General Plan. Bridgeport, California, USA, (Drafted July 1997 and Revised 2010). Conservation /Open Space Element-2012, Figure 1 (Attachment G).
[109] *Id.* at, p v-14 (See, Attachment G).
[110] *Id.* (Mr. Bleich conducted a web-based query for professional publications by Mr. Paulus on mule deer and the research returned zero results).
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The BLM and the Air District have failed to undertake the requisite investigation regarding the Project's environmental setting for mule deer. Absent adequate baseline data, the Project's impacts on migration of mule deer are impossible to determine. The Lead Agencies must require the Applicant to prepare adequate surveys, conducted by a ***qualified biologist*** that adequately portrays the migratory nature of mule deer within the Project area. This information is critical in order to fully assess and provide adequate mitigation for Project impacts. The proper baseline data must be included in a revised draft EIS/EIR.

I9-15 cont'd

2. The Draft EIS/EIR Fails to Provide Adequate Baseline Data for the Jeffery Pine Vegetation Community.

In *Galante Vineyards v. Monterey Peninsula Water Management District*, the Fourth District Court of Appeals found that an Air Quality section that briefly described the area as "sparsely populated, with no industry other than several vineyards" inadequate under CEQA because it failed to discuss a significant aspect of the environmental baseline in sufficient detail.[111] Here, the draft EIS/EIR's description of the environmental baseline of the Jeffery Pine Vegetation Community suffers from a similar error.

The draft EIS/EIR states wildlife habitats were categorized using the *CDFG's A Guide to Wildlife Habitats*.[112] In spite of this, biologist Scott Cashen found the habitat descriptions provided in the draft EIS/EIR fail to reflect such application.[113] CDFG guidance provides for 24 distinct habitat stages of the Jeffery Pine vegetation community.[114] Nonetheless, the draft EIS/EIR's description is limited to the following:

I9-16

> Jeffrey pines (*Pinus jeffreyi*) exist in the Project area as the dominant overstory species, occurring in pure stands of various size second-growth, as well as scattered individual trees of various sizes.[115]

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[111] *Galante Vineyards v. Monterey Peninsula Water Management District* (1997) 60 Cal.App.4th 1109, 1121-22.
[112] Draft EIS/EIR, p. 3.4-2.
[113] Cashen Comment, p. 2.
[114] *Ibid.*
[115] *Id.*

The abbreviated description is too vague to inform the public and decision makers regarding current habitat types present on the Project site.[116] The draft EIS/EIR's failure to distinguish between known habitat types has a systemic effect on the scope of impact analysis. For example, it is impossible to determine the extent of large and dense stands of Jeffery pine on the Project site, and thus the Project's impacts to the Pacific fisher.[117]

I9-16 cont'd

The draft EIS/EIR must be revised to describe the specific habitat stages present on the Project site, as well as the abundance and distribution of the specific habitat types associated with the special-status species identified in Table 3.4-1.[118]

3. The Draft EIS/EIR Fails to Adequately Describe the Area Affected for Special-Status Plants and Wildlife.

The draft EIS/EIR fails to adequately describe the area affected by the Project for numerous special-status plants and wildlife species. As a threshold matter, the draft EIS/EIR is absent any analysis of the new access roads or buffer zones around the geothermal power plant, well sites or transmission line.[119] The CDFW survey guidance states that buffer areas should be surveyed for special-status plant and wildlife when indirect project effects could potentially extend off site.[120] Mr. Cashen further notes, that although the draft EIS/EIR provides a list of all the special-status wildlife with the potential to occur on the surveyed area of the site, for each of the species there were either (1) no focused surveys conducted and/or (2) assertions that focused surveys not documented could not be substantiated.[121] However, for special-status wildlife focused protocol-levels surveys are extremely important and no amount of reconnaissance surveys will be able to detect the species.[122]

I9-17

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[116] *Id.*
[117] *Id.*
[118] Cashen Comments, p. 3-4.
[119] *Id.*, at p. 3. The draft EIS/EIR indicates that surveys of the new access roads will be conducted during the spring and summer of 2013, conspicuously *after* environmental review has been completed. The EIS/EIR also fails to incorporate the surveys as a required mitigation measure, and it does not identify the mitigation measures that would be implemented if special-status species were detected during the surveys. (*see also*, Draft EIS/EIR p. 3.3-1).
[120] Cashen Comment, pp. 2-4.
[121] *Id* citing to draft EIS/EIR section 4.4.1.2, 3.4-4.
[122] *Id.*
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The Applicant's special-status plant and wildlife survey efforts fail to provide an adequate basis for determining the Project's impacts to special-status and plant and wildlife species. The Applicant must complete adequate surveys ***prior to*** Project approval. Adequate surveys would include the necessary focused surveys and would cover all of the Project and buffer areas in order to establish the environmental baseline for the Project site. This information is fundamental to evaluating impacts and formulating mitigation, and must be provided in a revised draft EIS/EIR. Although the draft EIS/EIR attempts to analyze potentially significant impacts and formulate mitigation measures, this analysis may bear little resemblance to the analysis and mitigation that will be required after significant impacts are actually identified through adequate survey efforts. Hence, the draft EIS/EIR fails to provide an adequate description of the area affected, analysis of the potential impacts and identification of mitigation for these special-status species. Once the Applicant submits the results of the properly conducted surveys and the agencies have an opportunity to review the information, the draft EIS/EIR must be revised and re-circulated for public review and comment.

I9-17 cont'd

4. <u>The Draft EIS/EIR Fails to Provide Adequate Baseline Data on the Threatened Northern Goshawk.</u>

The Project site is located within a protected activity center ("PAC") for the northern goshawk, and five known northern goshawk nest sites have been identified within the Project area.[123] The draft EIS/EIR, however, fails to adequately describe the environmental setting, because the Applicant failed to provide sufficient information. Cashen explains that the value of the "calls and nest surveys" conducted by the Applicant in 2010 are troubling, at best.[124] The surveys lack any information on the methodology relied upon and provides no information to show compliance with the USFS survey protocols. The draft EIS/EIR must be revised to include baseline information on the local and regional status of the northern goshawk and the number and status of the PACs in the Inyo National Forest so that a meaningful and realistic look at the Project's impacts is provided.

I9-18

[123] Draft EIS/EIR p. 3.4-13.
[124] Cashen Comments, p. 4.
2632-021cv

5. The Draft EIS/EIR Fails to Adequately Describe the Environmental Setting for the American Marten.

The draft EIS/EIR states that the "lack of dense, multi-storied, multi-species late serial conditions (abundant downed logs, snags and large diameter trees) make it unlikely that the marten "use the area for dinning, resting and/or sustained foraging."[125] This conclusion conflicts with existing scientific literature and the draft EIS/EIR's finding that the species has been detected in the Project vicinity.[126] The Management Indicator Species Report prepared for the Project also indicates that the Project site includes "late seral stage forest," which is known habitat for the American marten.[127] Given the inconsistent and incorrect information presented in the draft EIS/EIR and its supporting documents, it is impossible to gauge the quantity and quality of American marten habitat in the Project area. Without an adequate environmental setting, the Project's impacts to the American marten and its habitat cannot be adequately assessed or mitigated. This information must be addressed and cured in a revised and re-circulated draft EIS/EIR. I9-19

6. The Draft EIS/EIR Fails to Adequately Describe the Environmental Setting for the Greater Sage-Grouse.

According to the draft EIS/EIR, the sage-grouse habitat on the Project site is of "marginal quality due to the low density of the sagebrush, the presence of interspersed Jeffery pines and the lack of herbaceous cover," and that "[s]age-grouse typically prefer dense, contiguous stands of sagebrush with little to no overstory."[128] This conclusion is unsubstantiated. The conclusion contradicts the draft EIS/EIR's own description of the sagebrush scrub vegetation community on the Project site, as well as information provided by the Applicant's biological resources consultant, all of which indicate that sage-grouse exhibits a habitat preference for sagebrush locations characterized by low, sparse vegetation and higher amounts of bare I9-20

[125] Draft EIS/EIR, p. 4.4-11.
[126] Cashen Comment, p. 5; *see also*, EIS/EIR, Table 3.4-1 and Biological Evaluation, p. 25 (on file with Lead Agencies).
[127] MACTEC. 2010. Draft Project Management Indicator Species Report: Casa Diablo IV Geothermal Development Project, Table 1. (Attachment H).
[128] Draft EIS/EIR, p. 4.4-10.

ground than adjacent sites.[129] The draft EIS/EIR further fails to provide any information pertaining to the June 2010 survey including the methodology used and the area studied. Here again, the draft EIS/EIR's failure to provide an adequate description of the environmental setting impedes the analysis of impacts and identification of mitigation for the northern sage-grouse. I9-20 cont'd

7. The Draft EIS/EIR Fails to Adequately Describe the Environmental Setting for the Sierra Nevada Red Fox and the Pacific Fisher.

The Sierra Nevada red fox is listed as threatened under the California Endangered Species Act, and the Pacific fisher is a candidate for listing under the federal Endangered Species Act. The draft EIS/EIR has acknowledged that both species have the potential to occur within the Project area.[130] However, as Cashen explains, the Applicant failed to conduct the required species-specific surveys and no baseline data regarding these special-status species is included in the draft EIS/EIR.[131] As a result, the Project's impacts on these special-status species cannot be adequately assessed or mitigated. I9-21

8. The Draft EIS/EIR Fails to Adequately Describe the Environmental Setting for the Pallid Bat.

The draft EIS/EIR provides inconsistent conflicting information on the potential for pallid bat roosts to occur on the Project site. In one instance, the document states that "[s]uitable foraging habitat exists across the Project site and suitable roosting habitat exists within the Jeffery pine forest along the northern boundary of the Project site. The species is thought to be present in the vicinity of the Project site based on habitat suitability."[132] However, the document later states that "[s]uitable roosting habitats such as cliffs (pallid bat) and caves (Townsend's I9-22

[129] Cashen Comments, pp. 4-5 citing to EIS/EIR p. 3.3-4. Plant communities found at the Basalt Canyon Geothermal Exploration Survey Area. Letter to S. Kerns, Wildlands Resource Managers from Jim Paulus re: Plant communities found at the Basalt Canyon Geothermal Exploration Survey Area dated June 18, 2001. (Attachment I). *See also* Connelly JW, ST Knick, MA Schroder, SJ Stiver (2004) Conservation Assessment of Greater Sage-grouse and Sagebrush Habitats Western Association of Fish and Wildlife Agencies, Unpublished Report. (Attachment J).
[130] Draft EIS/EIR, Table 3.4-1.
[131] Cashen Comments, p. 6.
[132] Draft EIS/EIR, p. 3.4-15.
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big-eared bat) are not found within the project area."[133] The Biological Evaluation for the Project found, "[t]he key components of habitat for the pallid bat consist of open foraging opportunities in combination with suitable roost areas in association with water."[134] Substantial evidence, including the draft EIS/EIS own findings, demonstrate these conditions are present within the Project area.[135]

I9-22 cont'd

The lack of focused surveys, in conjunction with the inconsistent information provided in the draft EIS/EIR must be resolved in a revised draft EIS/EIR in order to determine the Project's impacts to the pallid bat.

9. The Draft EIS/EIR Fails to Adequately Describe the Existing Setting for the Federally Endangered Owens Tui Chub.

The Owens tui chub is an extremely rare species on the brink of extinction; as such it is listed as endangered under both the state and federal Endangered Species Acts.[136] The Owens tui chub historically inhabited streams, rivers, springs and irrigation ditches in the Owens Basin, in Mono and Inyo Counties.[137] Finding that the Owens tui chub had been extirpated from much of its range – viable native populations are known only in two locations in Mono County – the United States Fish and Wildlife Service ("USFWS") designated a portion of Hot Creek as critical habitat for the Owens tui chub.[138] Hot Creek is located approximately 2 miles from the Project site.[139] The draft EIS/EIR states that "[t]here have been historic concerns that cumulative geothermal development in Long Valley may directly affect" Owens tui chub critical habitat.[140] The draft EIS/EIR further provides:

I9-23

> ...the geothermal reservoir has been shown to be connected to the surface waters and sensitive hot springs or other geothermal features in the south-southeastern caldera, these features, including the

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[133] *Id.*, at p. 4.4-10.
[134] Biological Evaluation, p. 23.
[135] Cashen Comments, p. 6.
[136] U.S. Fish and Wildlife Service, Department of the Interior, *Endangered and Threatened Wildlife and Plants; Endangered Status and Critical Habitat Designated for the Owens Tui Chub* Final Rule, 50 Fed. Reg., 31,592, August 5, 1985 (Attachment K); Cashen Comments, p. 8; Draft EIS/EIR, p. 3.4-12.
[137] *Ibid.*
[138] Draft EIS/EIR, p. 3.4-12.
[139] *Id. at*, p. 3.4-18.
[140] *Id. at*, p. 4.4-.13.
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springs at the Hot Creek State Fish Hatchery, may be affected by the additional development of the geothermal reservoir.[141]

Despite these concerns and the general description provided, the draft EIS/EIR fails to include three critical pieces of data regarding the Owens tui chub and its critical habitat.[142] First, the Lead Agencies fail to establish the current size and trend of the Owens tui chub population in the Hot Creek Headsprings. Without the baseline data on the current population, it is impossible to analyze the population's response to the Project including changes in the habitat (from water temperature, for example). It further precludes the ability to formulate any objective and meaningful triggers for adaptive management.[143]

Second, the draft EIS/EIR is missing vital hydrologic data to establish existing conditions. This information is readily available from the United States Geological Survey ("USGS"). The USGS has been collecting hydrologic monitoring data at the Hot Creek since the 1980s.[144] The Lead Agencies must disclose and evaluate this data.

I9-23 cont'd

Lastly, the draft EIS/EIR fails to provide information regarding the endangered species existing habitat conditions. As explained by Cashen, several habitat variables are believed to influence the Owens tui chub populations, including the prey base, cover, water quality, water chemistry and presence of predators, amongst others.[145] Cashen notes that the failure to quantify existing conditions pertaining to these habitat variables precludes the ability to determine whether a change in the Owens tui chub population is due to a Project-induced change in habitat, such as water temperature or a change in habitat that is unrelated to the Project. To make an assumption without such vital pre-project conditions defies logic and runs counter to the informational goals of NEPA and CEQA.

Ultimately, these omissions render the draft EIS/EIR legally inadequate. The draft EIS/EIR does not reflect any efforts on the part of the Lead Agencies to obtain the readily available monitoring data and disclose that information to the

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[141] *Ibid.*
[142] Cashen Comments, pp. 8 -9.
[143] *Id.*
[144] *Id.*
[145] *Id.*; *see also,* U.S. Fish and Wildlife Service 2009. Owens Tui Chub: 5-Year Review and Evaluation. (Attachment L).

public and decision makers. Some of this data (specifically, from USGS) is readily available, making the failure of the Lead Agencies to disclose that information even more egregious.[146] CEQA and NEPA require the BLM and the Air District to investigate and disclose information regarding the Project's potentially significant impacts in the draft EIS/EIR. The lead agencies failed to do that here.

I9-23 cont'd

B. The Draft EIS/EIR Fails to Provide a Sufficient Description of the Surface Water Conditions on the Project Site.

The draft EIS/EIR's identification and description of surface waters in the Project Area is unsupported and unreliable and does not constitute evidence upon which the Lead Agencies can rely.[147]

As a preliminary matter, there are two reasons that the Applicant's wetlands study cannot be relied upon by the BLM to represent real conditions on the ground. First, the Applicant's botanist, Jim Paulus, who also conducted the biological resources assessments, also prepared the Projects wetlands study. Yet, the wetlands study fails to identify his qualifications as a hydrologist. Therefore it is impossible to assess the qualifications of the consultant and, as a result, the wetlands study's description of the sites' hydrologic features is unreliable. Because the draft EIS/EIR relies exclusively on unqualified information in the botanist's wetlands study, there may be unidentified surface waters within the Project area. Second, any estimate made regarding identification and extent of waters of the United States remains unsubstantiated until the estimate has been verified by United States Army Corps of Engineers (the "Corps").[148]

I9-24

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[146] *See* Draft EIS/EIR, p. 4-13 (explaining that the Applicant is aware of the fact that such monitoring data exists and that the Long Valley Hydrologic Advisory Committee ("LVHAC") is continuously collecting it. Moreover, the Applicant proposes to coordinate with the LVHAC in accordance with Project Design Measure GEO-5.

[147] *See,* Jim Paulus, Ph.D., Investigation of Riverine Resources Including Wetlands at the Proposed CD4 Project (July 30, 2012).

[148] At this time, BLM and Air District have produced and no evidence of communication with the United States Army Corps of Engineers regarding verification of the consultant's findings on Waters of the Unites States, or with regard to the Project generally. *See,* letter dated January 12, 2013 from Burke S. Large, Assistant District Counsel, Department of the Army to Pamela N. Epstein, Attorney Adams Broadwell Joseph & Cardozo re Freedom of Information Act ("FOIA") request for the Casa Diablo IV Geothermal Development Project. (The letter states "[a]fter an extensive search, no

In addition, regarding the substance of the wetlands study, the draft EIS/EIR makes several material misrepresentations regarding the information contained in the study. First, the draft EIS/EIR states,

> A total of 1.89 acres of potential jurisdictional wetlands were mapped within the Project area, all in close proximity to the existing power plant facilities. The assessment performed by Paulus (Paulus, 2012) determined that the "blue line" drainages were *likely* not jurisdictional under the CWA except for in the area of the existing power plants.[149]

However, the botanist's wetlands study found 1.89 acres of *wetland vegetation alliances*, which do not necessarily reflect the total extent of jurisdictional wetlands in the Project area.[150] Wetland vegetation alliances indicate further study is needed to determine whether additional jurisdictional wetlands are present within the Project area. Vegetation is only one element of the equation. A complete analysis must also evaluate soils and hydrology. Open water areas are wetland, but may not have wetland vegetation. For example, Lake Tahoe is a wetland, but only a fraction has wetland vegetation. The EIS/EIR must be revised to include a complete assessment of potential jurisdictional wetlands inclusive of vegetation, soils and hydrology.

I9-24 cont'd

Second, the draft EIS/EIR incorrectly finds that, "[t]he RCA [Riparian Conservation Area] corridors mapped in the Upper Basalt and Basalt Canyon areas do not support riparian habitats or stream channels."[151] Here again, the draft EIS/EIR takes unwarranted liberties that result in a misrepresentation of the affected environment, this time with respect to stream channels. Cashen explains that, while discontinuous, stream channels actually are present in the Upper Basalt and Basalt Canyon areas.[152] The wetlands study itself noted a channel that originates at Shady

I9-25

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records have been found [in response to your FOIA request related to the Casa Diablo IV Geothermal Development Project].) (Attachment M).

[149] Draft EIS/EIR, p. 3.3-11.

[150] Paulus J. 2012. Investigation of Riverine Resources Including Wetlands at the Proposed CD4 Project, Table 1.

[151] Draft EIS/EIR, p. 3.3-18.

[152] Paulus J. 2012 Investigation of Riverine Resources Including Wetlands at the Proposed CD4 Project, p. 12; *see also* Draft EIS/EIR Appendix D.

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Rest Park, which would be crossed by one of the proposed Project's pipelines.[153]

I9-25 cont'

Finally, the draft EIS/EIR fails to map, or otherwise disclose, the extent of other waters, including waters of the State and aquatic habitats subject to regulation under Section 1602 of the Fish and Game Code. These features appear to be present within in the Project area. The wetlands study reported the presence of wetland vegetation and hydrology at an internally drained basin 600 feet north of proposed well pad 34-25.[154] The draft EIS/EIR indicates erosion control measures will be implemented where sediment run-off threatens "[w]aters of the State."[155] However, the draft EIS/EIR fails to map, or otherwise disclose, the extent of this water, other waters of the State or aquatic habitats protected by State law. As such, the Lead Agencies failed to comply with State law.

I9-26

The Lead Agencies must revise the draft EIS/EIR with an adequate description (including identification, quantification and mapping) of wetlands and State and federal jurisdictional waters, collected by a qualified hydrologist and verified by the Corps. By not including the information in the draft EIS/EIR, the Project's impacts on wetlands and jurisdictional waters cannot be reliably assessed or adequately mitigated.

In total, the description of the environmental setting in the draft EIS/EIR is inadequate and fails to comply with NEPA and CEQA. The draft EIS/EIR omits highly relevant and necessary information on biological and geological resources on the Project site. The Lead Agencies are required to gather the relevant data, and provide an adequate description of the existing environmental setting in a revised draft EIS/EIR.

I9-27

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[153] *Ibid.*
[154] *See* Paulus J. (2012) Investigation of Riverine Resources Including Wetlands at the Proposed CD4 Project and Draft EIS/EIR, Appendix D at p. D-18.
[155] Draft EIS/EIR, p. 4.3-18.
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V. THE DRAFT EIS/EIR FAILS TO CONTAIN A "HARD LOOK" OR ADEQUATELY ANALYZE ALL POTENTIALLY SIGNIFICANT PROJECT IMPACTS, AND PROPOSE APPROPRIATE AND FEASIBLE MITIGATION MEASURES.

A meaningful analysis and evaluation of all potentially significant environmental effects of a project is central to the purposes behind NEPA and CEQA. NEPA requires that agencies take a "hard look" at the environmental consequences of a proposed action.[156] A hard look is defined as a "reasoned analysis containing quantitative or detailed qualitative information."[157] An adequate EIR must contain facts and analysis, not just an agency's conclusions.[158] CEQA requires an EIR to disclose all potential direct and indirect, significant environmental impacts of a project.[159] The draft EIS/EIR must also describe possible conflicts between the proposed action and the objectives of Federal, State, regional and local land use plans, policies and controls for the area concerned.[160] I9-28

The draft EIS/EIR does not consider all of the Project's significant and foreseeable environmental impacts to air quality, biological resources, water resources, and impacts from hazardous materials, among others. The failure to disclose and address all the Project's impacts violates the basic requirements of NEPA and CEQA. The BLM and the Air District must revise its impacts analysis and re-circulate a substantially revised draft EIS/EIR for public review and comment.

A. The Draft EIS/EIR Fails to Adequately Disclose, Analyze, and Mitigate Significant Project Impacts on Air Quality and Public Health. I9-29

Dr. Petra Pless, an air quality expert, reviewed the draft EIS/EIR's analysis of impacts on air quality including technical reports related to air quality. Dr. Pless determined that the agencies failed to adequately analyze and undertake a "hard look" at all of the Project's air quality impacts and provide effective and feasible

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[156] *Robertson v. Methow Valley Citizens Council, supra*, 490 U.S. at 350; *Dubois v. U.S. Dept. of Agriculture, supra*, 102 F.3d at 1284.
[157] BLM, NEPA Handbook, p. 55 (See, Attachment F).
[158] *Citizens of Goleta Valley v. Bd. of Supervisors* (1990) 52 Cal.3d 553, 568.
[159] Pub. Resources Code, § 21100, subd. (b)(1); CEQA Guidelines, § 15126.2, subd. (a).
[160] *Id.*
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mitigation.[161] Dr. Pless's opinion and air quality modeling data serve as substantial evidence to demonstrate the Project will have significant impacts to air quality that were not disclosed and mitigated in the draft EIS/EIR. As detailed in these comments, the Project will result in significant and unmitigated air quality impacts. The agencies are legally obligated to disclose and mitigate all significant air quality impacts a revised draft EIS/EIR.

I9-29 cont'd

1. The Draft EIS/EIR Underestimates Emissions of Air Pollutants During Project Construction.

Maximum daily emissions from combustion exhaust during construction are primarily related to well drilling activities from diesel-powered engines on drill rigs. The draft EIS/EIR concludes that operation of diesel equipment during Project construction would result in emissions of nitrogen oxides ("NOx") in excess of the applicable CEQA significance thresholds for maximum daily emissions.[162] The draft EIS/EIR proposed Mitigation Measures AQ-1, but ultimately holds that the impacts from mobile off road equipment would be significant and unavoidable.[163] The draft EIS/EIR further holds that construction-related emissions of ROG and particulate matter ("PM"), PM10 and PM2.5 would be below the applicable CEQA thresholds for maximum daily emissions and are less than significant.[164] It is Dr. Pless's expert opinion that the draft EIS/EIR underestimated construction-related emissions of all pollutants and failed to require adequate mitigation for the significant NOx emissions.

I9-30

Dr. Pless identifies two major defects resulting in the draft EIS/EIRs underestimation of combustion exhaust emissions. First, the draft EIS/EIR's inconsistent portrayal of the drill rig engines horsepower and hours of operations. In one instance, the draft EIS/EIR assumes 1.354 brake horsepower ("bhp") drill rigs each operating 10 hours per day and one 197-bhp drill rigs operating 2 hours per day.[165] Elsewhere in the draft EIS/EIR, estimates were based on the Project requiring two large drill rigs each including approximately four engines with a combined engine rating of over 4.250 bhp per drill and operating for a combined

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[161] Letter from Dr. Petra Pless, to BLM and Air District (Jan. 13, 2013) (hereafter "Pless Comments") (Attachment D).
[162] Draft EIS/EIR, p. 4.2-14 (NOx emissions, as well as reactive organic gases, are ozone precursors).
[163] *Id.*, at p. 4.2-14.
[164] *Ibid.*
[165] *Id.*, Appendix C, p. 4.2-9.

total of 16 hours per drill rig.[166] The inconsistencies preclude an actual assessment of emissions, which could be significantly underestimated.

Second, the draft EIS/EIR worst-case emissions calculations are artificially constrained and unfounded. The draft EIS/EIR's assumption that the engines would meet the U.S. Environmental Protection Agency ("USEPA") and California Air Resources Board ("CARB") Tier 2 emission standard for diesel-powered off road engines because "the drill rigs would be registered with CARB's Statewide Portable Equipment Registration Program ("PERP")..." is mistaken. The Program is voluntary, and registration alone does not guarantee that drill rig engines used for Project construction will comply with Tier 2 emission standard.[167] In fact, if the drill rigs at the Project site were registered with PERP prior to December 31, 2009 and their registration renewed, the engines would only have to comply with Tier 1 emission standards, which are considerably higher.[168]

The draft EIS/EIR's findings that "no further feasible NOx emission control technology is feasible for drill rigs because the engines would comply with USEPA/CARB Tier 2 emissions standards for off-road equipment" is also flawed. As discussed, the assumption that drill rig engines would comply with Tier 2 standards is unsupported. The draft EIS/EIR should engage in a discussion regarding compliance with Tier 3 or 4 standards. Dr. Pless recommends retrofitting existing older equipment with a selective catalytic reduction system ("SCR"). Dr. Pless notes this technology has been successfully implemented on drill rig engines and, and therefore is feasible. In fact, the BLM has considered retrofitting drill rigs with SCR systems as a potential mitigation measure to reduce NOx emissions for the Casper Resources Management Plan.[169] Lastly, Dr. Pless suggests that Mitigation Measure AQ-1 be amended to include feasible mitigation, as set forth in detail.[170]

The draft EIS/EIR underestimates emissions of air pollutants during project construction, specifically from well drilling. The draft EIS/EIR must be revised to

I9-30 cont'd

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[166] *Id.*, at p. 4.2-2.
[167] Pless Comments, p.4.
[168] *Ibid.*
[169] Pless Comments, pp. 4-5. *See also,* Bureau of Land Management, Proposed Resource Management Plan and Final Environmental Impact Statement, June 2007, Appendix L, Air Quality Mitigation Matrix (Attachment N).
[170] *Id.*, at p. 6.
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include a realistic and consistent description of well drilling rigs, hours of operation, and emissions estimates and incorporate all feasible mitigations. I9-30 cont'd

2. The Draft EIR/EIS Fails to Identify the Project's Significant Health and Odor Impacts from Hydrogen Sulfide Emissions from Well Drilling.

The Project has the potential to release hydrogen sulfide ("H2S"), a known irritant and odorous, non-condensable gas. H2S has been proven poisonous at high concentrations.[171] The health related impacts from exposure can include nose, throat and lung irritation, digestive upset and loss of appetite, headache, dizziness to sudden collapse, unconsciousness and death depending on concentration.[172] Despite this, the draft EIS/EIR relegates its discussion of potential public health risks during construction of the Project to the following:

> During well cleanout and flow testing, geothermal fluids would likely be pumped into large open containers. H2S may temporarily be released from the geothermal fluid for several hours during these activities. The local H2S emissions during these activities could produce an objectionable "rotten egg" odor in the immediate vicinity of each well. However, these concentrations would not be expected to pose a health hazard and H2S emissions resulting from these activities would be temporary at each well development site and would occur for a relatively short period for several hours.[173]

I9-31

In Dr. Pless's expert opinion, the draft EIS/EIR's assessment and conclusion regarding potential public health risks and odor impacts associated with H2S emissions from construction of the Project's wells are uncorroborated and critical information and analysis is omitted. The draft EIS/EIR fails to conduct the necessary dispersion modeling upon which to engage in a meaningful discussion of the odor thresholds or potential health effects at various levels of H2S exposure.[174] Dr. Pless explains that the public health impacts at varying distances from the well

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[171] Draft EIS/EIR p. 4.2-4; *see also* Pless Comments, p.7; *see also* U.S. Department of Health and Human Services, Agency for Toxic Substances and Disease Registry, *Toxicological Profile for Hydrogen Sulfide*, July 2006, p.4 (hereinafter, "*Toxicological Profile for Hydrogen Sulfide*") (Attachment O).
[172] Pless Comments, p. 7.
[173] Draft EIS/EIR, p. 4.2-10.
[174] Pless Comments, p. 7.
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(e.g. at the campground) would depend on several factors: the pressure of the geothermal fluid or gas; how quickly the "bubbles" of gas dissolve or deposit into the air; the humidity and air movement (wind); and the geographical features of the landscape, well depression and the vegetation in the area, among others.[175]

The odor threshold for H2S is very low (less than 1 part per million "ppm") and subtle physiological effects can result at concentrations of 50 ppm, with serious health effects occurring at concentrations over 50 ppm.[176] The draft EIS/EIR states that well cleanout and testing could result in H2S releases in excess of 2.5 kilograms (2,500,000 milligrams or 2,500,000,000 micrograms) per hour, per well exceeding the 2.5 kilogram-threshold set by the Air District.[177] Additionally, the EIS/EIR's estimates must be doubled as the draft EIS/EIR proposes to construct two wells at a time.[178] To put the draft EIS/EIR's numbers in perspective, 1 ppm of H2S equals 1.5 milligrams per cubic meter or 1,500 micrograms per cubic meter. Moderately offensive odor occurs at 1.5 to 7.5 micrograms of H2S per cubic meter (1-5 ppm) and paralysis or death occurs at 7,500 to 15,000 micrograms H2S per cubic meter (500-1,500 ppm).[179]

I9-31 cont'd

When H2S gas is released it remains in the atmosphere for an average of 18 hours.[180] The draft EIS/EIR's "temporary" designation of H2S impacts is unsupported in light of the acute and chronic associated health risks and the extremely low thresholds of significance. These impacts are exacerbated in a cumulative sense when viewed with the planned and existing geothermal developments in the area.

The Project well sites are located within a mile or less of several recreational areas, as well as, publicly accessible trails.[181] As explained by Dr. Pless, the proximity of the wells to the recreation area combined with the concentration of

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[175] *Ibid.*
[176] *Id.*, at p. 7.
[177] Draft EIS/EIR, 4.2.10; Pless Comments, pp. 6-8.
[178] Draft EIS/EIR, pp. 2-34-35.
[179] Pless Comments, p. 7.
[180] Pless Comments, p.8. *See also, Toxicological Profile for Hydrogen Sulfide* at p.2 (*See,* Attachment O).
[181] Draft EIS/EIR, p. 3.2-5. The proposed Project has geothermal well location near the New Shady Rest Campground, the Pine Glen Campground and the Shady Rest Park; the latter is located w/in less than a half mile of six new well sites (Nos. 15-25, 25-25, 34-25, 52-25, and 38-25 and three existing well sites (Nos. 14-15, 12-25 and 57-25). The closest sensitive receptor Chance Ranch, a residence is located approximately 1.6 miles away from the Project.

H2S has the potential to cause significant exposure resulting a potential public heath risk.[182] In accordance with the draft EIS/EIR's construction schedule, construction activities would be undertaken during non-winter months, *i.e.* June through November, coinciding with periods when the nearby recreational areas are likely to have the highest occupancy.[183] Also, since hydrogen sulfide is heavier than air and, thus, closer to the ground, young children, who are shorter than adults, in the nearby Shady Rest Park, recreational area and nearby public trails experience greater exposure.[184]

I9-31 cont'd

The BLM and the Air District must prepare a revised draft EIS/EIR, which includes a dispersion model for the spread of gaseous sulfur compounds in order to properly analyze the Project's potentially significant public health and air quality impacts. Dr. Pless concludes the dispersion modeling is feasible as the Applicant already operates a number of existing geothermal wells, pipelines, and power plants in the vicinity and information about potential H2S releases and concentrations that occur during well testing and venting should be readily available.[185] The revised draft EIS/EIR must also indentify and include feasible mitigation measures to reduce the Project's H2S emissions.

3. <u>The Draft EIS/EIR Fails to Identify the Project's Significant ROG Emissions and Propose Feasible Mitigation.</u>

Reactive Organic Gas ("ROG") emissions are almost exclusively related to fugitive emissions of the motive fluid, n-pentane, at the binary power plant.[186] The Applicant estimates the Project will result in 410.0 lb/day and 74.8 tons/year ROG from fugitive n-pentane emissions, in exceedance of the applicable CEQA thresholds.[187]

I9-32

The draft EIS/EIR claims that the Project

> [i]s proposed to include state of the art equipment and best available technology that would limit fugitive ROG (i.e, n-pentane) emissions

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[182] Pless Comment, pp. 8-10.
[183] *Id.*, at p. 2-35.
[184] Pless Comment, p. 10. *See also*, *Toxicological Profile for Hydrogen Sulfide* at p.5 (*See,* Attachment O).
[185] *Id.*, at p. 10.
[186] *Id.*, at Table 4.2-4, p. 4.2-12.
[187] *Id.*, at Tables 4.2-4 and 4.2-5, p. 4.2-12.
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> and that *no additional feasible mitigation measures are available* to further substantially reduce fugitive ROG emissions, and the CD-IV Project would result in a significant and unavoidable impact related to long-term fugitive emissions of n-pentane.[188]

Dr. Pless recommends including in a revised draft EIS/EIR additional and/or more stringent, existing, feasible best available control technology for operational emissions of ROG.[189]

Feasible mitigation exists to reduce the Project's significant ROG emissions. Pless recommends incorporating leakless technology for motive fluid systems.[190] Pless notes that the Applicant's proposed use of screwed or threaded, flanges will result in leakage no matter how carefully executed while welded connections on the other hand do not (unless defective). Thus, welded connections would eliminate 100% of the emissions.[191] Leakless equipment technology is routinely used and required for construction of new or modified existing refineries and chemical facilities and is equally feasible for the Project.[192]

I9-32 cont'd

Pless also shows that additional and/or more stringent mitigation measures for the leak detection and repair program are feasible. While the Applicant's proposed BACT measure for equipment leaks includes the "placement of pentane-specific vapor sensors at strategic locations", as well as "leak checks, inspections, monitoring, and leak logging," Pless finds those measures inadequate to address smaller and slow leaks and therefore not BACT for the Project.[193] Instead, Pless recommends the USEPA's leak detection and repair ("LDAR") regulations for petroleum refineries and chemical manufacturing facilities. The implementation of LDAR is feasible, as it incorporates the elements of the proposed inspection program with additions, such as quantification of fugitive ROG leaks with a portable analyzer.[194]

A revised draft EIS/EIR should include a mitigation measure requirement to use leakless components for all equipment components that could result in fugitive

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[188] *Id.*, at p. 4.2-11 (emphasis added).
[189] Pless Comments, p. 12.
[190] *Id.* at p. 13.
[191] *Ibid.*
[192] *Id.*
[193] *Id.* at p. 14.
[194] *Ibid.*

leaks of the motive fluid n-pentane as well as a mitigation measure that includes the use of LDAR following the USEPA's *Best Practices Guide*.[195]

I9-32 cont'd

4. The Draft EIS/EIR Fails to Properly Disclose, Analyze, and Mitigate the Impacts from Transportation of Flammable Motive Fluid n-Pentane to the Site.

The motive fluid used by the Project, n-pentane, is a highly flammable liquid.[196] The draft EIS/EIR recognizes that the use of n-pentane requires a risk management plan ("RMP") in light of the potential risk of explosion and fire in its transport, which "could indirectly result in an incremental increase in the potential for accidents."[197] However, the draft EIS/EIR fails to provide the required off-site consequence analysis for the transportation of such hazardous substances.[198] The Project's potential impacts from the transportation of n-pentane are undisputed and yet the draft EIS/EIR defers conducting the necessary analysis upon which to engage in a meaningful assessment of the impacts.

I9-33

The draft EIS/EIR should be revised to provide an off-site consequence analysis for the flammable motive fluid n-pentane using USEPA's RMP Comp model as required by the USEPA's RMP to satisfy the requirements of NEPA and CEQA to disclose all potentially significant impacts to public health and the environment. The analysis should be inclusive of potential cumulative risks from other planned and existing geothermal facilities in the vicinity.

B. The Draft EIS/EIR Fails to Adequately Analyze Impacts to Biological Resources.

I9-34

Compliance with CEQA requires a lead agency's determinations be supported by credible analysis and substantial evidence.[199] NEPA requires that the level of

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[195] *Id., see also*; USEPA, Leak Detection and Repair Compliance Assistance Guidance, A Best Practice Guide (Attachment P).
[196] Draft EIS/EIR p. 4.13-6.
[197] *Id.*, at p. 4.13-7.
[198] Federal Clean Air Act section 112(c); *see* USEPA, Risk Management Plan Rule Guidance (Attachment Q).
[199] *See Berkeley Keep Jets Over the Bay Comm.* (2001) 91 Cal.App.4th at 1382; Pub. Resources Code, § 21080(e)(1); CEQA Guidelines, § 15064(f)(5).
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detail be sufficient to support a reasoned conclusion by comparing the amount and the degree of the impact caused by the proposed action and the alternatives.[200]

Here, the Lead Agencies biological impact analysis is entirely unreliable because, as described in the preceding sections, the draft EIS/EIR does not contain valid baseline data or provide a complete project description upon which to support an impact analysis. As such, the Lead Agencies' impact analysis is neither credible nor adequately supported. The draft EIS/EIR fails as an informational document, and the BLM and the Air District must circulate a revised draft EIS/EIR to comply with CEQA and NEPA's purpose and goals. Therefore, we provide the following preliminary specific comments with respect to the BLM's and the Air District's analysis of the Project's biological impacts.

I9-34 cont'd

1. <u>The Project will result in significant direct and indirect impacts to Mule Deer and their habitat that the draft EIS/EIR fails to properly analyze or mitigate.</u>

NEPA holds that "general statements about 'possible' effects and 'some risk' do not constitute a "hard look" absent a justification regarding why more definitive information could not be provided."[201] The draft EIS/EIR relies on the biological survey's assessment that mule deer have exhibited "tolerance" to the noise and human activity of the type exhibited with the Project.[202] The draft EIS/EIR then states there is insufficient data to speculate how migrating deer would respond to new barriers associated with the Project during construction and operation ultimately finding the impacts to be less than significant with the implementation of mitigation.[203]

I9-35

Mr. Bleich's comments reveal that issues associated with development or intrusion, and resultant effects on habitat fragmentation and/or alteration of movement corridors for the mule deer from energy projects, including geothermal projects, have been well documented.[204] This evidence demonstrates the impacts to deer habitat from the project are not too speculative and that the Project will likely result in a significant impact. The draft EIS/EIR's conclusion in this instance is unsupported and thus invalid.

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200 BLM NEPA Handbook, p. 55 (*See,* Attachment E); *see also* 40 C.F.R. § 1502.1 (2009).
201 *Neighbors of Cuddy Mountain v. U.S. Forest Service,* 137 F.3d 1372, 1380 (9th Cir. 1998).
202 Draft EIS/EIR p., 4.4-16.
203 *Ibid.*
204 Bleich Comments, pp. 3-4.

It is also Bleich's expert opinion that the proposed mitigation measures are incapable of reducing the Project's significant impact on mule deer to a less than significant level.[205] PDM BIO-1 proposes the following,

> [a] qualified wildlife biologist to walk the pipeline route once each year for the first three years following completion of construction to survey for any signs that the pipeline or its impeding wildlife movement. If such evidence is found, the USFS *may require* ORNI 50, LLC to clear one or more areas under the pipeline of at least 16 inches height, or sufficient to allow wildlife to pass under the pipeline, at the points where movement is impeded.[206]

However, the draft EIS/EIR fails to justify the effectiveness of the proposed measure. In the absence of any specific performance criteria or standards it is impossible for a biologist to determine if the pipeline is impeding wildlife movement by simply "walking" the pipeline route a total of three times.[207] Instead Bleich recommends the mitigation measure be redesigned to incorporate remote camera or other specialized techniques that would provide informative data on mule deer movement in the vicinity of the pipelines.[208] Mule deer in both the Round Valley and Casa Diablo herds have been fitted with radio-telemetry collars Bleich recommends this information be incorporated into the development of effective mitigation measures capable of reducing the potentially significant impacts to deer movement.[209]

I9-35 cont'd

Mitigation measure WIL-4 proposes construction of a "[d]eer crossing...[that will resemble]...the existing crossing at the SCE easement."[210] However, as Bleich explains, the draft EIS/EIR is devoid of any discussion regarding the efficacy of the existing SCE easement to provide relief to deer moving through the area.[211] It is illogical for the draft EIS/EIR to conclude the same type of easement is feasible or appropriate to mitigate the Project's impacts when an assessment regarding the

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[205] Bleich Comments, p. 12.
[206] Draft EIS/EIR, p. 2-48 (emphasis added).
[207] *Id.*
[208] *Id.*, at p. 14.
[209] *Ibid.*
[210] *Id.*, at pp. 2-57 and 4.4-30 (imposed for alternatives 1 and 3 only); *see also* Bleich Comments, pp. 14-15.
[211] *Ibid.*

efficacy of the existing SCE easement, which is touted as relieving similar impacts, has yet to be conducted.[212] This pervasive lack of analysis and substantiation is systemic, invalidating mitigation measures WIL-5 and WIL-6, as well.

Mitigation measure WIL-5 provides, in part, that the underground segments of the proposed pipelines are in alignment with suspected traditional migratory routes (which run parallel to those in the existing pipeline network).[213] However, the mitigation measure fails to provide any evidence that mule deer habitually use roads for movement. In fact, the evidence contained in the consultant's reports actually reveals that deer move only sparingly cross the pipelines at the buried sections.[214] Further, the measure relies on installation of underground pipelines at a "prescribed frequency."[215] In what appears to be the draft EIS/EIR's pattern and practice, no explanation is provided to decipher what is meant by "prescribed frequency." Without an understanding of the concept the decision makers and the public have no way to accurately assess its viability to minimize, avoid or lessen the acknowledged impact. I9-35 cont'd

Lastly, monitoring proposed by WIL-6 fails to incorporate necessary performance criteria thereby making it impossible to determine what triggers the need for remedial action. Belich explains that clearly defined sampling methods are needed. He recommends that revised mitigation include multiple sample years to account for variances associated with deer movements and behavior from which specific triggers and performance criteria can be extrapolated.[216]

The draft EIS/EIR must be revised to include this missing information and an adequate analysis of the Project's impacts in order to identify and assess and properly mitigate the Project's significant impacts on mule deer migration.

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[212] Draft EIS/EIR, pp. 2-57 and 4.4-30 (imposed for alternatives 1 and 3 only); *see also* Bleich Comments, pp. 14-15.
[213] *See,* Draft EIS/EIR, pp. 2-57, 4.4-31 (Figure 4.4-1).
[214] Bleich Comments, p. 15.
[215] Draft EIS/EIR, pp. 2-57 and 4.4-30.
[216] Bleich Comments, p. 15.
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a. *The draft EIS/EIR must adequately disclose, analyze and mitigate the Project's potentially significant impacts from vehicular road strikes on mule deer.*

The draft EIS/EIR must include sufficient detail to enable those who did not participate in its preparation to understand and to consider meaningfully the issues raised by the proposed Project.[217] A prejudicial abuse of discretion occurs if the failure to include relevant information precludes informed decision-making and informed public participation, thereby thwarting the statutory goals of the environmental review process.[218]

Here, the draft EIS/EIR is missing key information to assist the agencies and the public in reviewing the potentially significant impacts to mule deer from increased vehicle strikes. The draft EIS/EIR's identification and analysis of the issue is limited to the following:

> The location of the new power plant and the pipelines running south of it in the Proposed Action would introduce new barriers to mule deer migration moving downslope from north to south to access meadow and riparian communities associated with Mammoth Creek. It is not known whether this would force some migrating deer further west and closer to U.S. Highway 395 where they would be subject to increased mortality due to vehicular collisions.[219]

I9-36

The draft EIS/EIR fails to discuss the location of the Project near a California Department of Transportation known "hot spot" for deer vehicular collisions along the 395 Highway.[220] Belich provides additional unrebutted evidence that the risk of deer strikes is elevated when normal resident habitats and migratory corridors are blocked forcing the deer into areas where they are in a position to encounter roadways.[221] While an agency need not speculate about all conceivable impacts it must evaluate the reasonably foreseeable significant effects of the proposed action.[222] Reasonable foreseeability is defined, as "the impact is sufficiently likely to

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[217] *Association of Irritated Residents*, 107 Cal.App.4th at 1390.
[218] *Al Larson Boat Shop, Inc. v. Board of Harbor Commissioners* (1993) 18 Cal.App.4th 729, 748.
[219] Draft EIS/EIR page 4.4-17.
[220] Belich Comments, p. 6.
[221] *Ibid.*
[222] *Sierra Club v. Marsh* (1992) 967 F.2d 763.

occur that a person of ordinary prudence would take it into account in reaching a decision."[223] Belich's comment letter provides more than enough substantial evidence to signify that impacts to mule deer from potential vehicular strikes is foreseeable and potentially significant as a result of the Project's development.[224] The lack of information contained in the draft EIS/EIR undermines a meaningful analysis of the Projects potentially significant impacts.

I9-36 cont'd

The Lead Agencies must prepare a revised draft EIS/EIR, which identifies the significance of the Project's impacts on mule deer from road kills, and proposes all feasible mitigation.

2. The Draft EIS/EIR Fails to Include an Adequate "Hard Look" Analysis of Project Impacts to the Owens Tui Chub and the Hot Creek Hatchery.

The draft EIS/EIR recognizes the Owens tui chub as a state and federal endangered species.[225] The draft EIS/EIR concludes that the Proposed Action would not result in impacts to Owen's tui chub or its habitat [the Hot Creek Hatchery].[226] The conclusion is wrong and lacks the necessary credible analysis and substantial evidence to comport with NEPA and CEQA. The draft EIS/EIR's analysis in support of its finding is inadequate resulting in unmitigated Project impacts to this highly protected species which raises issue regarding compliance with the Endangered Species Act.

I9-37

Compelling evidence exists to demonstrate the Project development will impact the Owens tui chub and its habitat. Contrary to the draft EIS/EIRs findings that "changes in hot spring temperatures have not been accompanied by changes in chemistry of the water which would indicate a change in thermal inflow"[227] biologist Scott Cashen explains, information collected by the USGS shows that the thermal-water component in the springs has declined by 30% to 40% between 1990 and 2000.[228] Since then the thermal-water component has continued to decline.[229] The

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[223] *Ibid.*; *see also, Dubios v. Dept of Agriculture*, 102 F.3d 1273, 1286 (1st Cir. 1996).
[224] Bleich Comments, pp. 5-6.
[225] Draft EIS/EIR, p. 3.4-12.
[226] *Id.*, at p. 4.4-8.
[227] *Id.*, at p. 4.4-13.
[228] Sorey ML. 2000. Geothermal Development and Changes in Surficial Features: Examples from the Western United States. Proceedings of the World Geothermal Congress 2000 (May 28 – June 10, 2000) pp. 705-711 (Attachment R).

data also reveals a decline in the total volume of thermal water entering the Hot Creek Headsprings since the early 1990s (which coincides with geothermal development at the Casa Diablo geothermal complex).[230] This information must be incorporated and accurately reflected in the draft EIS/EIR's impact analysis. The current exclusion of this information casts serious doubts on the documents current conclusions.

Furthermore, as explain in Mr. Hagamann's comments (discussed in depth below), the Applicant's finding that the Project's increase in geothermal extraction will not significantly impact existing conditions is uncertain and requires further study and verification.[231] Substantial evidences exists indicating that the environmental consequences of the Project and its significant 83% increase in geothermal power production at the Casa Diablo geothermal complex will result in significant and unmitigated impacts on geothermal resources and the ecology of the Project region, including sensitive resources.[232] The draft EIS/EIR also fails to examine the impact of the additional 30 years of energy production at the Casa Diablo geothermal complex, as is required by law.[233] The Lead Agencies must prepare a draft EIS/EIR, which identifies the significance of the Project's impacts on the state and federally endangered Owens tui chub and its habitat and propose all necessary and feasible mitigation.

I9-37 cont'd

3. The Draft EIS/EIR Fails to Disclose a Potential Violation of the Endangered Species Act.

a. General Obligations Under the Endangered Species Act

Section 7(a)(2) of the federal Endangered Species Act ("ESA") prohibits agency action that is "likely to jeopardize the continued existence" of any endangered or threatened species or "result in the destruction or adverse modification" of its critical habitat.[234] To "jeopardize the continued existence of" means "to engage in an action that reasonably would be expected, directly or

I9-38

[229] Howle JF, CD Farrar, K Bazar (2012) Long Valley Hydrologic Advisory Committee Hydrologic Monitoring Data for the Period Ending December 2011 (Attachment S).
[230] *Ibid.*
[231] Hagemann Comments, p. 5.
[232] *Ibid.*, at pp. 4-5; *see also*, Cashen Comments pp. 17-19.
[233] *Laurel Heights I* at, pp. 396-397 (EIR held inadequate for failure to assess impacts of second phase of pharmacy school's occupancy of a new medical research facility).
[234] 16 U.S.C. § 1536(a)(2).
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indirectly, to reduce appreciably the likelihood of both the survival and recovery of a listed species in the wild by reducing the reproduction, numbers, or distribution of that species."[235] An action is "jeopardizing" if it keeps recovery "far out of reach," even if the species is able to cling to survival.[236] Thus, "an agency may not take action that will tip a species from a state of precarious survival into a state of likely extinction. Likewise, even where baseline conditions already jeopardize a species, an agency may not take action that deepens the jeopardy by causing additional harm."[237]

If the proposed action "is likely to adversely affect" a threatened or endangered species or adversely modify its designated critical habitat, the BLM must engage in "formal consultation" with the USFWS to obtain its biological opinion as to the impacts of the proposed action on the listed species.[238] Once the consultation process has been completed, the USFWS must give the BLM a written biological opinion "setting forth [USFW's] opinion, and a summary of the information on which the opinion is based, detailing how the agency action affects the species or its critical habitat."[239]

If USFWS determines that jeopardy, destruction or adverse modification of critical habitat is likely, USFWS "shall suggest those reasonable and prudent alternatives which [it] believes would not violate subsection (a)(2) of this section and can be take by the Federal agency or applicant in implementing the agency action."[240] "Following the issuance of a 'jeopardy' opinion, the [BLM] must terminate the action, implement the proposed alternative, or seek an exemption from the Cabinet-level Endangered Species Committee pursuant to 16 U.S.C. section 1536(e)."[241]

I9-38 cont'd

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[235] 50 C.F.R. § 402.2; *see also Nat'l Wildlife Fed'n v. NMFS,* 534 F.3d 917 (9th Circ. 2008) (NWF v. NMFS II) (rejecting agency interpretation of 50 C.F.R. § 402.2 that in effect limited jeopardy analysis to survival and did not realistically evaluate recovery, thereby avoiding an interpretation that reads the provision "and recovery" entirely out of the text).
[236] *NMF v. NMFS II, supra,* 524 F.3d at 931.
[237] *Id.* at 930.
[238] 16 U.S.C. § 1536(a)(2), (b)(3); *see also* 50 C.F.R. § 402.14(a), (g).
[239] 16 U.S.C. § 1536(b)(3)(A); *see also* 50 C.F.R. § 402.14(h).
[240] 16 U.S.C. § 1536(b)(3)(A).
[241] *National Ass'n of Home Builders v. Defenders of Wildlife,* 511 U.S. 644, 652 (2008).
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b. The BLM Failed to Engage in Section 7 Consultation

The BLM has failed to comply with its consultation requirements, pursuant to the ESA, for the federally endangered Owens tui chub. Additionally, the EIS/EIR fails to analyze the USFWS's potential issuance of a biological opinion and incidental take permit under Section 7. Therefore, the draft EIS/EIR is wholly inadequate. The BLM must disclose and analyze these activities in a revised draft EIS/EIR that is circulated to the public for review and comment.

The ESA prohibits "take" of threatened and endangered species.[242] "Take" is defined as "to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or attempt to engage in any such conduct."[243] "Harm" includes "significant habitat modification or degradation where it actually kills or injures wildlife by significantly impairing essential behavior patters, including breeding, feeding or sheltering."[244] The BLM must initiate formal consultation with the USFWS "at the earliest possible time" when seeking to undertake an action that "*may* affect a listed species, its habitat, or any designated critical habitat."[245] I9-39

As recently reiterated by the court, in *Center for Biological Diversity v. Bureau of Land Management*, the "may affect" standard "must be set sufficiently low to allow Federal agencies to satisfy their duty to insure under section 7(a)(2) [that species are not jeopardized.]"[246] In that case, a question existed over whether groundwater withdrawals were a "relevant factor" in determining if the project would likely jeopardize the continued existence of any listed fish species or result in the destruction or adverse modification of the their habitat as a result of the Project. The court noted that when actions "may affect" listed species, the burden is on the Federal agency (here, the BLM) to show the absence of likely adverse effects to the listed species or critical habitat as a result of its proposed action in order to

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[242] 16 U.S.C. § 1538(a)(1)(B).
[243] 16 U.S.C. § 1532(19).
[244] 50 C.F.R. § 17.3 (2009).
[245] 16 U.S.C. § 1536(a)(2), (b)(3); *see also* 50 C.F.R. § 402.12(a),(g); *see also* Bureau of Land Management, 6840 – Special Status Species Management Manual, Release 6-121 (Jan. 17, 2001) p. 23 (emphasis added) (the Manual states that formal consultation is required "unless written concurrence that an action is not likely to adversely affect the species is received from FWS and/or NMFS.") (Attachment T) (hereinafter, "BLM Special Status Species Mgnt Manual").
[246] *Center for Biological Diversity v. Bureau of Land Management*, 2012 WL 5193100 *17 citing *Flowers*, citing *Flowers*, 414 F.3d at 1072 (quoting 51 Fed. Reg. at 19949) (internal quotations omitted).

be excepted from the formal consultation obligation."[247] The court further expounded upon the role of petitioners, finding that while the petitioners in the *CBD* case had the burden of showing that the groundwater withdrawals "may affect" listed species or critical habitat, the burden was not a heavy one and, in fact, petitioners need only show that an effect on listed species or critical habitat is "plausible."[248]

For the proposed Project, the "may affect" determination is more than plausible, it is practically certain. First, the BLM itself acknowledges in the EIS/EIR, that the proposed Project *may* have an impact on the Owens tui chub and its critical habitat, the Hot Creek Fish Hatchery.[249] This alone triggers BLM's consultation requirement, as *"[a]ny possible effect, whether beneficial, benign, adverse, or of an undetermined character*, triggers the formal consultation requirement."[250] Moreover, as discussed, substantial evidence clearly demonstrates that the Project will have unaddressed and/or improperly mitigated direct, indirect and cumulative impacts on the species and its critical habitat, thereby precluding the BLM from meeting its onerous burden of showing an adverse impact is unlikely.

I9-39 cont'd

The draft EIS/EIR and its appendices reveals no indication that the BLM has initiated consultation with the USFWS. The BLM must do so prior to release of the revised Draft EIS/EIR. Without incorporation of the results of consultation in the Draft EIS/EIR, the public cannot meaningfully assess the environmental effects and mitigation for the impacts to the Owens tui chub. Furthermore, without full public disclosure and opportunity for comment, USFWS will be required to conduct further environmental review under NEPA for its Biological Opinion and take permit, which could conflict with the existing document and would incur substantial duplication and/or modification to the Project. For the reasons stated, the BLM must engage in formal consultation with the USFWS. The failure to do so is a violation of both the ESA and NEPA.

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[247] *Id.* citing 51 Fed. Reg. 19926, 19949 (6/3/86).
[248] *Id.* at. *17.
[249] EIS/EIR, p. 4.4-14, 19.
[250] *Center for Biological Diversity v. Bureau of Land Management*, 2012 WL 5193100 *17 (emphasis in original) citing *Cal. Wilderness Coal v. U.S. Dep't of Energy*, 631 F.3d 1072, 1006 (9th Cir. 2011).
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4. The Draft EIS/EIR Fails to Disclose, Analyze and Mitigate Significant Impacts from Noise on Biological Resources.

Elevated noise levels are considered a serious threat to ecological communities because it has the potential to alter physiology, behavior, and population ecology of wildlife.[251] For example, elevated noise levels may have an adverse effect on a species' ability to acquire prey, avoid predators, obtain food (from avoidance of habitat near noise source) or communicate.[252] The draft EIS/EIR fails to disclose, analyze or provide mitigation for potentially significant noise impacts from the Project on wildlife.

The draft EIS/EIR indicates drilling operations will take place 24 hours per day, 7 days per week, and each geothermal well will take approximately 60 days to complete.[253] Noise level estimates provided by the draft EIS/EIR are presented as averages; therefore peak levels will be presumably higher and are improperly undisclosed. During drill operation and construction, noise is estimated to reach 85 dBA at 50 feet.[254] During operation of the power plant noise will average a level of up to 71.5 dBA at 150 feet, 64.5 dBA at 400 feet, 54 dBA at a quarter of mile or 1,320 feet and 48 dBA at half a mile or 2,640 feet, the midpoint of the plant.[255] The noise produced at the well pumps is estimated at 58 dBA from 100 feet. Cashen provides substantial evidence that the *average* levels of noise produced by the project are high enough to result in a significant impact to wildlife.[256] For example, Cashen notes that sound levels above 50 dBA have been found to be potentially deleterious to breeding birds within an average of 1,000 meters or 3.280 feet from the noise source.[257]

I9-40

The extent of the adverse effects cannot fully be evaluated because the draft EIS/EIR fails to provide basic baseline information regarding wildlife distribution within the Project site. Relation of the noise to sensitive biological resources plays a significant factor in the analysis. The draft EIS/EIR must be revised to include this

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[251] Cashen Comments, pp. 21-22.
[252] *Ibid.*
[253] Draft EIS/EIR p. 2-25.
[254] *Id.*, at p. 4.11-3 and 5.
[255] *Id.*, at p. 4.11-7.
[256] Cashen Comments, pp. 21.
[257] *Id.*, at pp. 21-22.

missing information, engage in an adequate analysis of the Project's impacts on wildlife from noise and provide all feasible mitigation measures. I9-40 cont'd

5. The Draft EIS/EIR Fails to Disclose, Analyze and Mitigate Impacts from Soil Stabilizers.

The draft EIS/EIR states soil stabilizers (including soil binders, dust suppressants, and/or dust palliatives) will be generally applied over ground surfaces at the Project site.[258] The majority of soil stabilizers is composed of waste products from the manufacturing industry and may contain chemicals that are toxic to plants and animals.[259] Evidence shows that the application of soil stabilizers have been associated with the browning of trees along roadways and stunted vegetation growth in forest lands, and have been the cause of sickness and adverse effects on reproduction in terrestrial animals.[260] The draft EIS/EIR completely fails to disclose, analyze, or provide mitigation for these adverse environmental impacts. I9-41

6. The Draft EIS/EIR Fails to Disclose, Analyze and Mitigate Impacts to Northern Goshawk.

Despite the sensitivity of the northern goshawk and its recorded occurrence over the Project site, the draft EIS/EIR does not contain any analysis of the Project's potential impacts to the goshawk PACs, nor does it propose any specific mitigation measures.[261] The draft EIS/EIR fails to identify the location of Project activities such as tree removal and road construction, in relation to the five northern goshawk nests sites located in the Project area. This information is essential to evaluating the types and severity of the Project impacts and the absence of this information renders the document completely inadequate. I9-42

Moreover, the conclusion in the Biological Evaluation that the Project is unlikely to result in a trend towards federal listing or loss of viability is misleading and not the law.[262] Furthermore as Cashen explains, the Draft EIS/EIR's conclusion that the Project won't result in listing the species under ESA is

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[258] Draft EIS/EIR p. 2-54.
[259] U.S. Environmental Protection Agency, (2004). Potential Environmental Impacts of Dust Suppressants: Avoiding another Times Beach. In: An Expert Panel Summary, May 30-31, 2002 (Attachment U).
[260] Cashen Comments, p. 20.
[261] Draft EIS/EIR, p. 4.4-8-9.
[262] *Id.* p. 4.4-9.
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unscientific. It fails to account for the considerable difference between localized and national impacts.[263] Cashen recommends the draft EIS/EIR assess the significance of the Project's impacts to the northern goshawk at the local or regional level, and then evaluate how impacts to the local or regional population may affect the statewide or national population in order to arrive at a realistic representation.[264] Here again, the requirements under NEPA and CEQA to analyze and mitigate the Project's significant impacts are different than the BLM's requirements pursuant to the ESA. BLM and the Air District's failure to properly identify, analyze and mitigate impacts to the northern goshawk in the draft EIS/EIR violates NEPA and CEQA, and BLM's failure to consult with the USFWS for its possible take of the species violates the ESA.

I9-42 cont'd

7. The Draft EIS/EIR Fails to Analyze and Mitigate Impacts to the Greater Sage-Grouse.

The Draft EIS/EIR concludes that direct effects to nesting sage-grouse would be minimal due to the marginal quality and limited availability of suitable nesting habitat in the Project area.[265] The draft EIS/EIR's conclusion is unfounded. It is also in direct conflict with available scientific literature and the Applicant's survey report.

I9-43

The loss and fragmentation of sagebrush habitat is considered the primary cause of sage-grouse population declines.[266] The Draft EIS/EIR acknowledges, "[t]he highways and existing geothermal development are significant barriers to [sage grouse] emigration from the known local use areas."[267] Construction of the Project will result in a loss of approximately 39.56 acres of sagebrush habitat, which the Management Indicator Species Report ("MISR") concludes will not lead to a change in the distribution of the greater sage-grouse across the Sierra Nevada bioregion.[268] Here again, Cashen explains by reviewing the impacts from a bioregional level rather than in terms of the South Mono population management unit ("PMU") the MISR artificially minimizes the Project's impacts.[269] Further diluting the Project's realist impact is the draft EIS/EIR's failure to consider the

[263] Cashen Comments, p. 13.
[264] *Ibid.*
[265] Draft EIS/EIR p. 4.4-10.
[266] Cashen Comments, p. 14.
[267] Draft EIS/EIR, p. 4.4-10.
[268] *Id.*, at p. 4.4-10.
[269] Cashen Comments, pp. 14-15.
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effects of the Project's transmission line, roads and fencing which are known to compromise the health and safety of the sage-grouse in the South Mono PMU.[270]

Cashen concludes the mitigation proposed by the Applicant is also inadequate. The mitigation relies on pre-construction surveys for sage-grouse leks[271] to "ensure that there are no residual impacts to the sage-grouse."[272] The mitigation fails to establish any specific performance criteria or enforcement mechanisms in which to mitigate the loss and degradation of sage-grouse habitat or address the adverse effects of the transmission line, roads and fencing.[273] As a result, the significant impacts to the sage-grouse are unknown and unmitigated.

The draft EIS/EIR also fails to adhere to BLM's own policies regarding sage-grouse habitat. BLM requires specific measures that *minimize impacts* to sage-grouse habitat for right-of-way applications that are longer than one mile or that would disturb more than two surface acres.[274] BLM's policy not only requires onsite mitigation but also indicates the consideration of offsite mitigation measures developed in cooperation with the Applicant and other resource agencies, such as USFWS.[275] The Draft EIS/EIR is noticeably absent any evidence that this type of measure or coordination has occurred, or will occur.

I9-43 cont'd

8. <u>The Draft EIS/EIR Fails to Identify and Address the Project's Potentially Significant Impact on Trees.</u>

An EIS/EIR must identify and focus on all the possible significant environmental impacts of a proposed project.[276] In 2006, the USGS began collecting data on tree kills.[277] As explained by Cashen in his comments, there is little doubt that tree kills are linked to geothermal power production activities and this effect is

I9-44

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[270] *Ibid.*
[271] Id. at pp. 5, 14. The sage grouse is a species known for its elaborate courtship rituals in which the males gather in a "lek" (or group) to attract females. The lek occurs in the same location. In Long Valley, there have been nine consistently counted actively sage-grouse leks.
[272] Darft EIS/EIR, p. 4.4-10.
[273] *Id.* at p. 15.
[274] United States Department of the Interior, Bureau of Land Management. 2012 Nov 16. Wildlife: Greater sage-grouse conservation (Attachment V).
[275] *Ibid.*
[276] Pub. Resources Code, § 21100 subd. (b)(1); CEQA Guidelines, § 15126, subd. (a); 40 C.F.R. § 1502.16.
[277] Cashen Comments, pp. 9-10, 21 and 30.
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documented at the Casa Diablo geothermal complex.[278] Cashen highlights the potentially significant impacts on trees by referring to the Draft EIS/EIR's evidence that trees are killed by geothermal development:

> [n]on-native annuals such as cheatgrass, redstem filaree, black mustard, Russian thistle (*Salsola tragus*), and silver hairgrass (*Aira caryophyllea*) attain weedpatch dominance and up to 90 percent cover where recent thermal activity has killed native shrubs and trees.[279]

I9-44 cont'd

Despite this recognition, the draft EIS/EIR fails to consider the Project's potentially significant impacts on trees. Tree kills are a potentially significant Project impact, which must be addressed and mitigated in a revised draft EIS/EIR.

C. The Draft EIS/EIR Fails to Adequately Address Impacts to Geothermal Resources.

1. The Draft EIS/EIR's Conclusion Regarding the Project's Impacts from Expansion of Geothermal Resources is Unsupported.

The proposed Project will "increase the existing extraction of geothermal fluid from the reservoir by 50% and expand production by 6,000 gallons per minute."[280] A finite amount of energy, in the form of heat, is stored in the hot springs. Despite these facts, the draft EIS/EIR concludes the Project will be designed in a way to prevent or mitigate any potential impacts to the hot springs and fish hatchery from geothermal operations.[281] Expert, Matt Hagemann, reviewed the draft EIS/EIR and its technical documents concluding its finding of less than significant impact is unsupportable, as well as contrary to the Applicant's own modeling estimates which reveal there are potentially significant declines in thermal discharge, temperature, and reservoir pressure as a result of the Project.[282]

I9-45

To conclude that the thermal water and pressure declines are insignificant and result in "...limited potential for adverse impacts on the Owens tiu chub or its

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[278] *Id.*
[279] Draft EIS/EIR, p. 3.3-5.
[280] *Id.*, at p. 4.7-3.
[281] *Id.*, at p. 4.8-2.
[282] *See*, Hagemann Comments, pp. 2-4.

critical habitat as a result of the operation of the Proposed Action [,]"[283] the draft EIS/EIR holds,

> [a]lthough the CD-IV Project is forecast to reduce the thermal outflow to Hatchery Springs by *about* 17 percent, the thermal water fraction is a very small part (less than 5 percent) of the total flow, so the impact to the combined cold and thermal discharge at the springs is forecast to be reduced by 0.85 percent and is not likely to be measureable relative to climatic effects. In addition, conductive buffering of the temperature would minimize potential temperature changes making such changes difficult to detect.[284]

I9-45 cont'd

Hagemann found several unsubstantiated claims weakening the validity of EIS/EIR's conclusion. First, Hagemann identifies that the draft EIS/EIR mischaracterizes the reliability of the Applicant's estimation of a reduction in thermal outflow by "about 17 percent."[285] The actual verbiage in Appendix D is expressed as "could be a ~17% decline," which Hagemann explains is more than just semantics; that within the scientific community the reduction is viewed as a statement without any real limits.[286] The realistic context of the 17% decline undermines the foundation of the draft EIS/EIR's conclusion.

Second, the claim that thermal water fraction is less than 5% of the total discharge is not supported by any analysis in Appendix D and no other reference is provided by the draft EIS/EIR. Lastly, the draft EIS/EIR relies upon the undefined and unproven concept of "conductive buffering" as having the capability to minimize potential temperature changes.[287] Such a claim cannot be asserted without first defining the term and second, supplying evidence that it can occur in the Project area in the manner and method that would minimize temperature changes. The draft EIS/EIR must also provide a discussion regarding what, if any, impacts are associated with conductive buffering on temperatures in waters reaching the springs and the fish hatchery. Hagemann also recommends that a revised draft EIS/EIR should include an independent review, preferably by USGS, of the modeling estimates for the reservoir temperature and pressure declines.[288] The

I9-46

[283] Draft EIS/EIR, p. 4.4-14.
[284] *Id*, at p. 4.7-7 (emphasis added).
[285] Hagamann Comments, pp. 3-4.
[286] *Ibid.*
[287] Hagamann Comments, p. 5.
[288] *Id.*

Mammoth Community Water District articulated the same recommendation to the lead agencies during the scoping stage.[289] I9-46 cont'd

In addition, in Hagemann's expert opinion, the impacts to geothermal resources will remain significant even with the proposed mitigation measures.[290] The proposed mitigation simply provides that the Project will be operated in conformance with existing monitoring conducted by the Long Valley Hydrologic Advisory Committee coupled with undefined remedial action programs.[291] Instead, Hagemann recommends that a revised draft EIS/EIR incorporate feasible enhanced monitoring provisions, which define management actions tied to observations of critical temperature or pressure changes and reductions.[292] This type of monitoring is critically important because, even if detected, impacts to recreational features and habitat cannot be simply reversed; a period of recovery is necessary and for some species like the endangered Owens tui chub, could be permanent.[293] I9-47

The Lead Agencies must prepare a revised draft EIS/EIR that adequately considers the Project's significant impacts on downgradient resources from temperature and pressure declines and propose appropriate mitigation measures accordingly. I9-48

D. The Draft EIS/EIR Fails to Disclose Analyze, and Propose Mitigation for Significant Impacts to Water Resources.

1. <u>The Draft EIS/EIR Fails to Fully Disclose, Analyze and Mitigate for the Project's Potentially Significant Impacts on Water Quality from Accidental Motive Fluid Release.</u>

The draft EIS/EIR fails to disclose or include an analysis of the Project's potential to impact water quality from accidental motive fluid release. This deficiency renders the draft EIS/EIR inadequate under CEQA and NEPA. I9-49

Substantial evidence exists which demonstrates that the Project will result in potentially significant impacts to water quality. As documented in Mr. Hagemann's comments, isobutane, the motive fluid currently used at the Casa Diablo

[289] Draft EIS/EIR Appendix A, pp. 1-162.
[290] *Id.* at p. 6.
[291] *Ibid.*
[292] Hagemann Comments, p. 5.
[293] *Ibid.*

geothermal complex, has been detected by the USGS in downgradient surface water, in fumaroles at Casa Diablo and in the Hot Bubbling Pool, three miles to the east of the Project area.[294] The existing geothermal plants use a closed-loop system which is intended to isolate the isobutane from the injection wells; however, the presence of the isobutane has led the USGS to conclude that inadvertent leaks to the injection system occur and that a hydrologic interconnection exists between the injection wells and downgradient surface water.[295] The hydrologic interconnection highlights the symbiotic relationship between the geothermal resources and associated fish and wildlife within the Project area, particularly the Owens tui chub and its critical habitat in the Hot Creek Fish hatchery. In sum, impacts associated with geothermal resource development will spill over, creating similar impacts to the Project region's ecology.

I9-49 cont'd

Further evidence from USGS shows that less than 10% of the fluid injected at Casa Diablo moves into the production zone and that most flows away from the well field within the injection reservoir.[296] The conclusion that injection fluid, including spent brine and other chemical additives, can move downgradient with the flow of groundwater to degrade groundwater resources and interconnected surface bodies, including springs, is further substantiated by Appendix D, which states that isobutene leaks have travelled to the Long Valley geothermal system.[297]

I9-50

The draft EIS/EIR also fails to identify the chemicals that will be used during well drilling and construction to enhance production or injection of geothermal fluids. At present, the draft EIS/EIR only states, as part of Mitigation Measure HAZ-1, that the Project will achieve compliance with all local, state, and federal regulations regarding the use, transport, storage, and disposal of hazardous materials and wastes and that a Hazardous Materials Business Plan will be updated.[298] First, the courts have been clear that facial compliance with regulatory standards does not alone ensure an insignificant impact.[299] Secondly, in order to appropriately evaluate the Project's impacts and satisfy CEQA and NEPA's requirement for the draft EIS/EIR to function as an informational document the chemicals used must be identified.

I9-51

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[294] Hagemann Comments, pp. 6-7.
[295] *Id.*
[296] *Id.*
[297] Draft EIS/EIR, Appendix D, p. D-33.
[298] Draft EIS/EIR, p. 4.13-2.
[299] *Californians for Alternatives to Toxics v. Dept. of Food and Agriculture* (2005) 136 Cal.App.4th 1, 16.

Substantial evidence confirms the potential for leakage is a significant, impact that remains unaddressed. A revised draft EIS/EIR must cure this defect, as well as disclose the chemicals used for drilling and operations. I9-52

2. The Draft EIS/EIR Fails to Identify the Project's Potentially Significant Impact on Water Quality from Brine Injection Activities.

The draft EIS/EIR fails to address the Project's impact on water quality due to brine reinjection activities. Substantial evidence shows a hydrologic connection between the injection wells and surface water.[300] Injection wells at geothermal plants carry not only spent brine but also may include chemicals used to prevent biofouling, corrosion, and scaling of the plant equipment.[301] The draft EIS/EIR fails to describe the chemicals injected at the Casa Diablo geothermal complex. I9-53

As explained by Mr. Hagemann, injectate, including spent brine and any chemical additives, can degrade groundwater resources and interconnected surface water bodies, including springs.[302] The release of spent brine and other chemicals to the aquifer and, in turn, to surface water, is a significant, unmitigated impact, which poses a potential ecologic risk to aquatic resources.[303] A revised draft EIS/EIR should be prepared to document all chemicals injected including spent brine composition and chemical additives, to determine whether continued spills are reasonably likely, and to assess the potential for these compounds to move to surface water bodies where they may pose an ecological risk.

3. The Draft EIS/EIR Fails to Properly Identify, Analyze and Mitigate the Project's Potentially Significant Impacts on Wetlands and Jurisdictional Waters.

The draft EIS/EIR's impact analysis for direct and indirect impacts on federal and state jurisdictional wetlands and waters of the United States ("WOUS") at the proposed Project site from potential construction and operation activities was I9-54

[300] Hagemann Comments, p. 7.
[301] *Id.*
[302] *Id.*, at 7-8.
[303] *Id.*

limited to a comparison of the proposed construction areas with maps of the water features.[304] The conclusion of the comparison mapping was that,

> [d]irect impacts to potentially jurisdictional features in the study area are not expected. Project facilities are not planned for those areas identified during vegetation surveys that support vegetation typically associated with wetlands. RCAs in the study area will be avoided through implementation of PDM HYD-2, which requires pipelines and access roadways to be located outside of any delineated RCAs.[305]

However, it is extremely difficult, if not virtually impossible, for the public and decision makers to evaluate Project impacts to jurisdictional features, or to verify the conclusions presented in the draft EIS/EIR. First, as explained above, the Applicant's delineation of wetlands and State and federal jurisdictional waters was not conducted by a qualified expert, but by a botanist. Second, the Applicant's wetland study has not been verified by the Corps. Third, the draft EIS/EIR fails to provide a map that depicts the location of the Project features in relation to the WOUS or identifies the location of waters of the State and other regulated waters. When a map of the Project features is superimposed over the maps provided in the Applicant's report, the resulting images (Figures 1 and 2, depicted below) provide evidence that the conclusions presented in the draft EIS/EIR are erroneous. Specifically, no substantial evidence supports the draft EIS/EIR's statements that (a) the Project facilities are not planned for areas that support vegetation typically associated with wetlands; and (b) pipelines and access roadways would be located outside of any delineated RCA. Instead, the Project facilities are proposed in areas that support vegetation typically associated with wetlands; and pipelines and access roadways would be located within delineated RCAs.

I9-54 cont'd

[304] Draft EIS/EIR, p. 4.3-2.
[305] *Ibid*, p. 4.3-8.

I9-54
cont'd

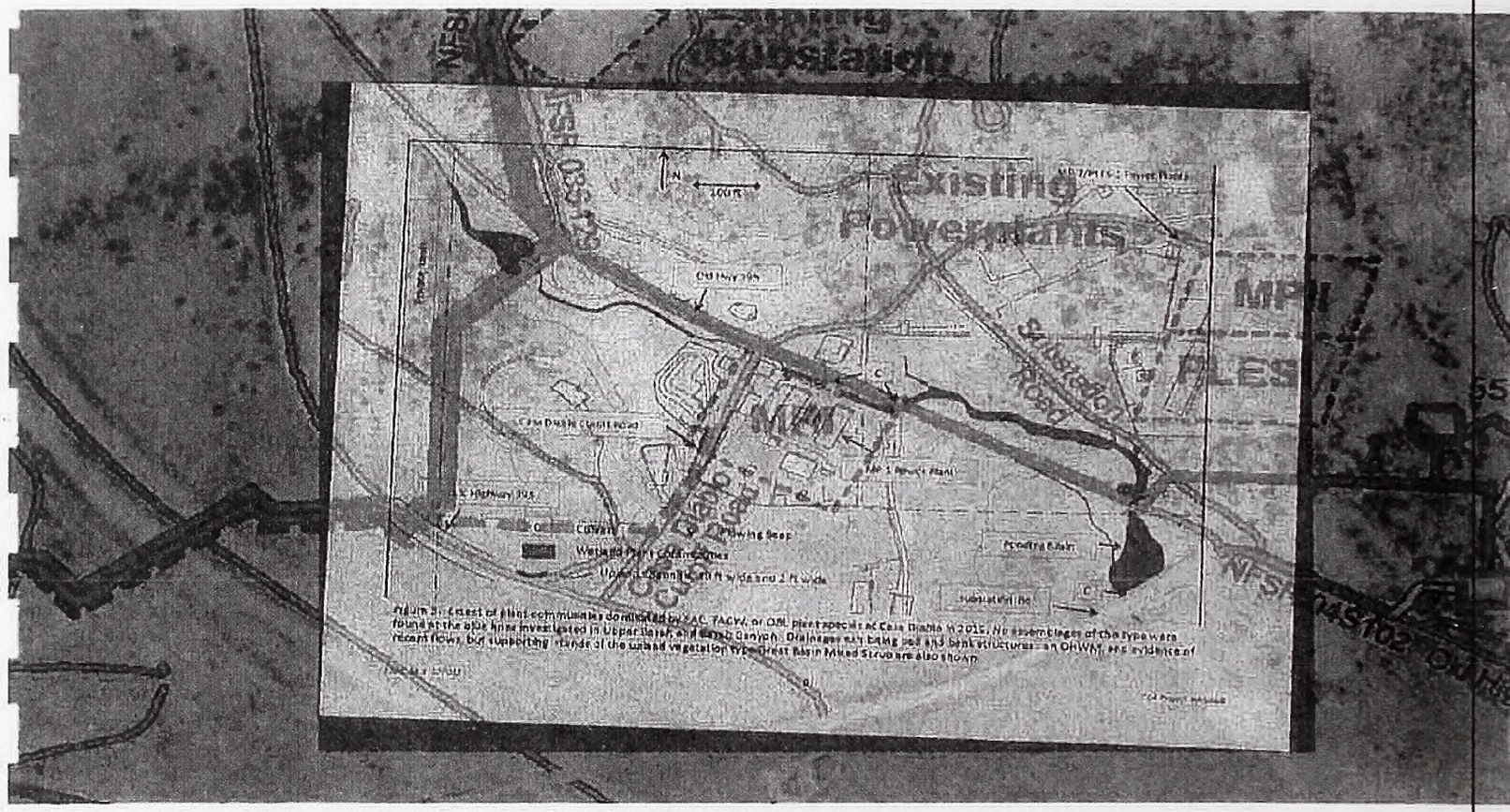


FIGURE 1

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I9-54
cont'd

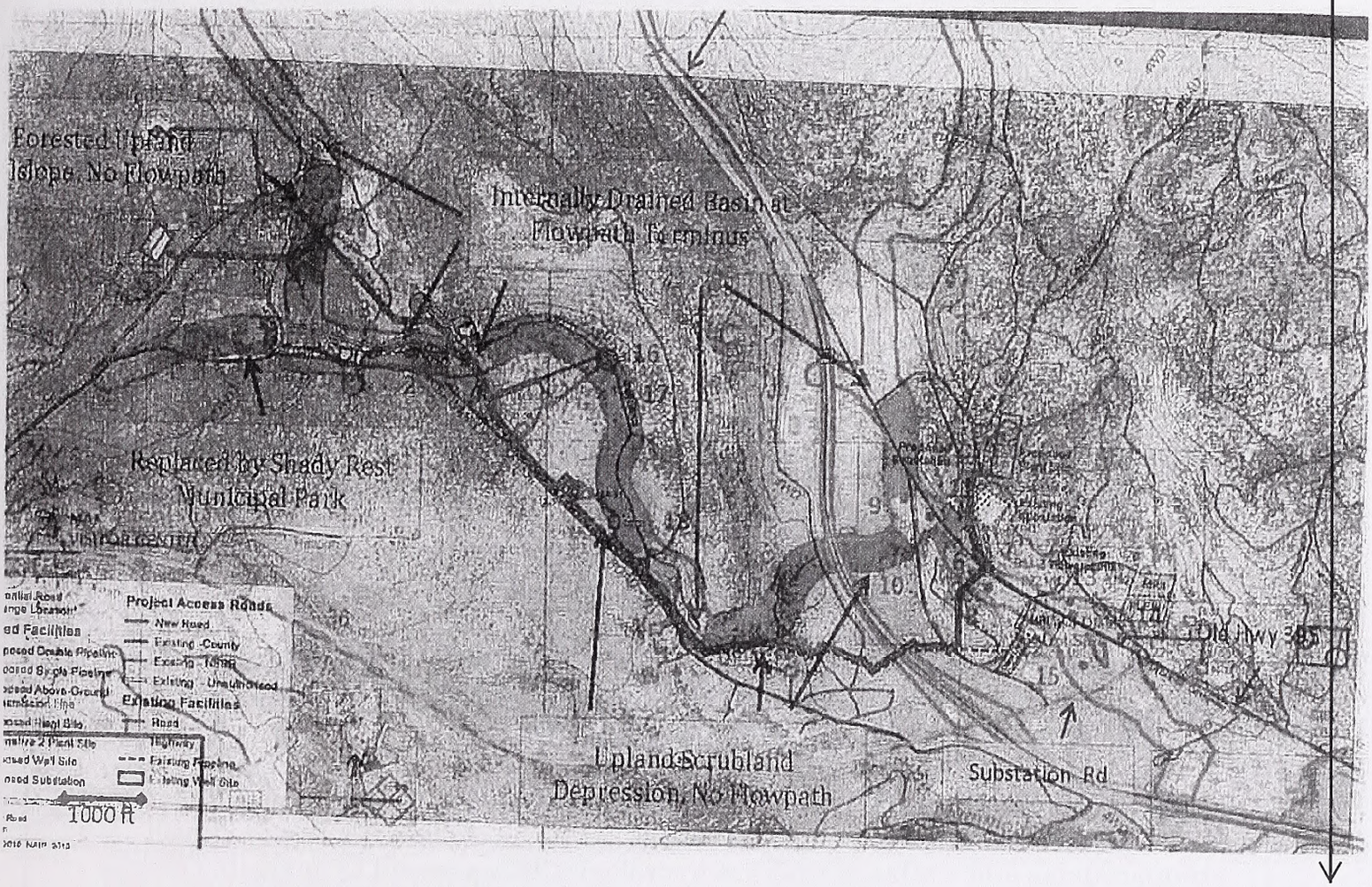


FIGURE 2

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The above mapping clearly depicts new pipelines traversing through wetland plant communities, RCAs, and potential jurisdictional wetlands. Figure 1 illustrates Project features near existing power plants in relation to wetlands mapped by Paulus. Project pipelines (turquoise lines) would pass through wetlands (the dark blue polygons). In figure 2, the Project features are shown in relation to RCAs (red corridor) and blue line stream sources. Project pipelines (turquoise lines) would pass through RCAs and potentially jurisdictional features (non-shaded portions of corridor). The figures provide mere examples of the failure to properly identify, address and evaluate the Project's impacts on jurisdictional waters and wetlands.

I9-54 cont'd

The draft EIS/EIR further misrepresents the information contained in the Applicant's wetland study by failing to acknowledge the study's recognition that pipelines and roads could affect stream courses and the RCAs.[306] The draft EIS/EIR is absent any description, let alone discussion, of how impacts to these features would be avoided.

These potentially significant impacts must be properly disclosed, analyzed and mitigated in a revised and re-circulated draft EIS/EIR.

a. <u>The Project Will Require a Section 404 Permit from the Army Corps of Engineers, Which is not Disclosed or Analyzed in the Draft EIS/EIR.</u>

I9-55 cont'd

As discussed and acknowledged by the Applicant's consultant, the proposed Project's pipeline network (including access roads) have the potential to impact streamcourses and wetlands that are hydrologically connected to navigable waters and are thus subject to the jurisdiction of the Corps under the Clean Water Act. A Corps Section 404 permit is therefore required to build the proposed pipeline and its associated roadways. Because the Corps has responsibility for approving a portion of the proposed Project, it is considered a responsible agency with which the Lead Agencies must coordinate its environmental review.[307]

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[306] Paulus J. (2012) Investigation of Riverine Resources Wetlands at the CD4 Project, caption to Figure 1.

[307] *See* Pub. Resources Code, §§ 21080.3, 21080.4; *see also* CEQA Guidelines, § 15063(g), 15082(b)-(c), 15086(a)(1), 15096; *see also Save San Francisco Bay Association v. San Francisco Bay Conservation and Development Comm.* (1992) 10 Cal.App.4th 908, 922.

One of the most important requirements for a Section 404 permit is that a project must be designed to avoid and minimize impacts to jurisdictional waters: it must be the least environmentally damaging practicable alternative or "LEDPA."[308] In this case, what the Corps ultimately approves as the LEDPA may differ from the pipeline design and route currently proposed by the Applicant and analyzed in any of the alternatives in the draft EIS/EIR.

To avoid a situation where the Corps requires modifications to the proposed route that were not analyzed in the draft EIS/EIR, the Applicant must coordinate early with the Corps concerning the proposed design, so that the draft EIS/EIR's impact analysis addresses the design that will ultimately be built. There is no evidence in the draft EIS/EIR that such coordination occurred. The draft EIS/EIR failed to properly identify the Project's impacts on jurisdictional waters and provide necessary details regarding the Project's new and improved access roads. Because the Applicant and the Lead Agencies have failed to coordinate this design process, the draft EIS/EIR's analysis of impacts from the pipeline and road is meaningless.

I9-55 cont'd

4. The Draft EIS/EIR Fails to Disclose all Potentially Significant Impacts on Water Quality From the Project's Access Roads.

The Lead Agencies have a legal responsibility to identify, analyze and mitigate all significant impacts. The draft EIS/EIR has failed to identify and analyze the impacts of stormwater runoff on water quality related to the pipeline and wellfield access roads. Moreover, these Project features are potentially unpermitted point sources. The Project will require a National Pollutant Discharge Elimination System ("NPDES") for these access roads, pursuant to section 402 of the Clean Water Act ("CWA").[309]

I9-56

In *Northwest Environmental Defense Center v. Brown* ("NEDC"), the Ninth Circuit found runoff flows from logging roads into a system of ditches, culverts, and channels and then into forest streams and rivers were "point sources" within the meaning of the CWA and therefore require NPDES permits.[310] The case involved two logging roads in Oregon's Tillamook State Forest. The Oregon Department of Forestry and the Oregon Board of Forestry own the roads. Various timber

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[308] *See* 40 C.F.R. § 230.10(a).
[309] *See,* 33 U.S.C § 1342(a); *see also, S. FL. Water Mgmt. Dist. V. Miccosukee Tribe of Indians,* 541 U.S. 95, 102, 124 S.Ct. 1537 (2004).
[310] *See, Northwest Envtl. Def. Ctr. v. Brown* 617 F.3d 1176, 1193 (9th Cir. 2010).
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companies used the roads to access logging sites and to haul timber. As a threshold matter, the Ninth Circuit found logging was "associated with industrial activity," and water that runs off a logging road into "any discernible, confined and discrete conveyance," such as ditch or culvert, must be regulated as a point source requiring a NPDES permit.[311]

The court's decision was based on a review of the statutory definition of "point source," and case law interpreting the distinction between point and nonpoint sources. The court defined nonpoint source pollution, based on its own precedent, as "the type of pollution that arises from many dispersed activities over large areas, and is not traceable to any single discrete source."[312] Because "runoff is not inherently a nonpoint or point source of pollution," according to the court, the distinction between point and nonpoint source discharges turn not on the runoff itself, but rather on whether stormwater "is allowed to run off naturally (and is thus a nonpoint source) or is collected, channeled, and discharged through a system of ditches, culverts, channels, and similar conveyances (and is thus a point source discharge)."[313]

The Project's access roads are analogous to the logging roads in *NEDC*. There are a number of surface water features in the vicinity, including Hot Creek, which flows into the Owens River, approximately 10 miles northeast of the Project site and several USGS blue line streams.[314] Specifically, wells 55-32 and 65-32 are located in areas that are tributaries to Hot Creek.[315] Although, the draft EIS/EIR improperly defers the Applicant's "Drainage and Runoff Management Plan" ("Drainage Plan"), the draft EIS/EIR acknowledges that drainage features, which "comply with the plan to minimize erosion and off-site sedimentation" will accompany new access roads and "[o]ff-site stormwater will be intercepted in ditches and channeled around the well sites to energy dissipates...".[316] Despite the lack of detail, a strong presumption exists that the stormwater runoff generated at the access roads will be "collected, channeled and discharged" through a "discernible, confined and discrete conveyance" and preempted from "run[ing] off naturally", thus resulting in an unpermitted point source.

I9-56 cont'd

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[311] *Id.* at p. 1194.
[312] *NEDC v. Brown*, 640 F.3d at 1070 (quoting *League of Wilderness Defenders/Blue Mountains Biodiversity Project v. Forsgren*, 309 F.3d 1181, 1184 (9th Cir. 2002)).
[313] *Id.* at p. 1071.
[314] Draft EIS/EIR p. 3.19-1.
[315] *Id.*, at p. 4.19-3.
[316] *Id.*, at p. 4.19-1.
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The full impacts from these discharges are currently obscured because, as discussed, the draft EIS/EIR failed to provide an adequate baseline description of hydrologic conditions on the Project site. The failure to address this impact is a violation of the CWA and both NEPA and CEQA.

I9-56 cont'd

VI. THE AGENCIES MUST DEVELOP AND IMPOSE ALL APPROPRIATE AND FEASIBLE MITIGATION ON MEASURES TO REDUCE OR AVOID THE PROJECT'S IMPACTS.

Both NEPA and CEQA require that lead agencies address all potentially significant impacts through the enforceability of alternatives and mitigation measures that will avoid or minimize such impacts. An EIS must provide a full and fair discussion of every significant impact, as well as inform decision makers and the public of reasonable alternatives which would avoid or minimize adverse impacts.[317] Under CEQA, an EIR must not only discuss measures to avoid or minimize adverse impacts, but must ensure that mitigation conditions are fully enforceable through permit conditions, agreements or other legally binding instruments.[318] A CEQA lead agency is precluded from making the required CEQA findings unless the record shows that all uncertainties regarding the mitigation of impacts have been resolved; an agency may not rely on mitigation measures of uncertain efficacy or feasibility.[319] This approach helps "insure the integrity of the process of decision by precluding stubborn problems or serious criticism from being swept under the rug."[320]

I9-57

Here, the draft EIS/EIR fails to comply with legal requirements regarding the consideration of mitigation measures by relying on vague, infeasible, unenforceable or improperly deferred mitigation measures for several significant impacts.

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[317] 40 C.F.R. § 1502.1.
[318] CEQA Guidelines, § 15126.4, subd. (a)(2).
[319] *Kings County Farm Bur. v. County of Hanford* (1990) 221 Cal.App.3d 692, 727-28 (a groundwater purchase agreement found to be inadequate mitigation because there was no record evidence that replacement water was available).
[320] *Concerned Citizens of Costa Mesa, Inc. v. 32nd Dist. Agricultural Assn.* (1986) 42 Cal.3d 929, 935.

A. The Measures Proposed in the Draft EIS/EIR to Reduce the Project's Potentially Significant Impacts to Water Quality are Inadequate.

The draft EIS/EIR's proposed mitigation measures are inadequate to reduce the Project's water quality impacts. CEQA requires that mitigation measures be adequate, timely and resolved by the lead agency. An EIR must identify mitigation measures for each significant impact.[321]

Here, Project well construction and drilling will require surface disturbing activities such as drilling mud, drill cuttings, and water and geothermal fluid. Installation of the pipeline network could require additional surface disturbing activities, including trenching, grading, and disturbance of surface sediments. While the draft EIS/EIR acknowledges that pollutants associated with these activities can be entrained in stormwater and flow offsite, resulting in degradation of water quality, it concludes the impacts will be mitigated to "less than significant."[322] As will be discussed, the proposed mitigation measures do not reduce or avoid potentially significant impacts because the measures either do not specifically address water quality issues or the measures sweep stubborn problems under the rug. As a result, potentially significant impacts from stormwater and flooding, as well as water quality impacts, remain unmitigated. I9-58

1. The Lead Agencies May Not Rely on SW-1 Because it Impermissibly Defers Preparation of a Drainage Plan.

Deferral of the formulation of a mitigation measures to post-approval studies is generally impermissible.[323] An agency may only defer the formulation of mitigation measures when it "recognizes the significance of the potential environmental effect, commits itself to mitigating the impact, and articulates specific performance criteria for the future mitigation."[324] "A study conducted after approval of a project will inevitably have a diminished influence on decision I9-59

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[321] CEQA Guidelines, § 15126.4, subd. (a)(1)(A).
[322] Draft EIS/EIR p. 4.19-22.
[323] *Sundstrom v. County of Mendocino* (1988) 202 Cal.App.3d 296, 307 (hereafter *Sundstorm*); *see also* CEQA Guidelines, § 15126.4, subd. (a)(1)(B).
[324] *Gentry, supra*, 36 Cal.App.4th at p. 1411 citing *Sacramento Old County Assn. v. County Council* (1991) 229 Cal.App.3d 1011, 1028-1029.

making. Even if the study is subjected to administrative approval, it is analogous to the sort of post hoc rationalization of agency action that has been repeatedly condemned in decisions constructing CEQA."[325]

Mitigation measure SW-1 requires the Applicant to prepare a Drainage Plan.[326] This measure defers preparation of a plan that is designed to minimize runoff and surface water pollution until after Project approval. The public and decision makers cannot assess whether runoff and surface water pollution may remain significant during the public review process. Instead, this information will only become available after Project approval. As a result, Measure SW-1 fits the very definition of a post hoc rationalization of agency actions and violates CEQA.

I9-59 cont'd

2. The Lead Agencies May Not Rely on Mitigation Measure SW-2 Because of Its Uncertain Efficacy or Feasibility.

Mitigation Measure SW-2 states that all containment basins and sumps will be constructed to contain flows from 100-year storm events with sufficient freeboard.[327] The measure is absent a description of what is meant by "sufficient freeboard."[328] As expert Hagemann explains, it is feasible to utilize hydrologic engineering calculations to determine the amount of freeboard necessary to contain any overtopping flows anticipated from a 100-year storm event.[329] Hagemann further recommends that peak discharge flows during a 100-year storm event should be calculated and used to identify the size of the containment basins and freeboard.[330] Without this level of detail, it is impossible for the decision makers and the public to assess the effectiveness of the proposed mitigation. Furthermore, the lead agencies lack substantial evidence that the mitigation measure would reduce the Project's impacts to less than significant in clear violation of CEQA.

I9-60

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[325] *Sundstrom, supra*, 202 Cal.App.3d at p. 307.
[326] Draft EIS/EIR, p. 4.19-4. (SW-1 refers to the Plan as a means of "evaluat[ing] potential changes in stormwater flow that would result from implementation of the Project, to the extent required to determine implementation of appropriate measures to minimize, avoid, retain or otherwise prevent increases in stormwater runoff leaving the site and minimize erosion.").
[327] *Id.*, at p. 4.19-22.
[328] *Ibid.*
[329] Hagemann Comments, p. 8.
[330] *Ibid.*
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3. The EIS/EIR Improperly Defers Preparation of a Stormwater Pollution Prevention Plan.

The Project proposes to construct up to 16 wells, each with a 0.4-acre well pad (for a possible total of 6.4 acres). The EIS/EIR holds that appropriate measures, such as the preparation of a Stormwater Pollution Prevention Plan ("SWPPP"), will be used to control offsite discharges.[331] The potential preparation of a SWPPP is a textbook example of deferred mitigation.[332] The failure to prepare and include the SWPPP in the draft EIS/EIR is especially egregious because the Regional Water Quality Control Board ("RWQCB") submitted scoping comments to the Lead Agencies that articulated a requirement for the Applicant to prepare a SWPPP for the Project *if it would disturb more than one acre of land.*[333] As the Project is likely to disturb up to 6.4 acres, a revised draft EIS/EIR, which includes the SWPPP, must be prepared. In accordance with Hagemann's recommendations the SWPPP should identify all construction activities, pollutants that may be generated during those activities, and best management practices to prevent contamination of stormwater runoff during well construction and operation. I9-61

The draft EIS/EIR must be revised and re-circulated to include the necessary analysis and appropriate mitigation for the Project's impacts on water quality.

B. The Measures Proposed in the Draft EIS/EIR to Reduce the Project's Potentially Significant Impacts Due to Spread of Invasive Plant Species are Inadequate.

The maintenance of access roads within and outside the Project site boundaries has the potential to introduce invasive plant species into disturbed areas and facilitate the spread of noxious weeds.[334] Invasive plants degrade habitats by inhibiting the growth of native plant species. The results are elimination of food, cover, and breeding sites used by native wildlife.[335] Furthermore, if left unchecked, invasive plants can convert the vegetation I9-62

[331] Draft EIS/EIR, p. 4.3-3.
[332] *Ibid.*
[333] Appendix A, p. A-122, Letter from the RWQCB submitted during scoping stage (emphasis added) (on file with Lead Agencies).
[334] Draft EIS/EIR, pp.3-10, 4.3-10.
[335] Cashen Comments, p. 24-25.
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community type and can increase fire hazards.[336] The draft EIS/EIR concludes these impacts would be mitigated through the application of mitigation. The draft EIS/EIR lacks the basis for this conclusion as the mitigation exclusively applies to the Project's construction phase, failing to account for the continuous spread of noxious weeds during the operation and maintenance and decommissioning phases.

When mitigation measures would, themselves, cause significant environmental impacts, NEPA requires an evaluation of those secondary (indirect) impacts.[337] Here, the draft EIS/EIR fails to analyze impacts from chemical control as a means of containing and controlling noxious weeds because according to the draft EIS/EIR, the "site specific information on target weed species are not known at this time."[338] This statement is patently false. The draft EIS/EIR acknowledges that noxious weed surveys have been conducted for the Project site.[339] The draft EIS/EIR must assess the impacts from chemical control methods of noxious weed control. As Cashen explains, there are two major implications. First, herbicides can have a direct and indirect impact on non-target organisms.[340] If such herbicides are or may be used, the draft EIS/EIR must analyze the potentially significant impacts of those herbicides on the environment. Second, a review of the noxious weed report shows herbicide may not be the only feasible method of controlling some noxious weed species. If herbicides will not be utilized the draft EIS/EIR must identify and evaluate the efficacy of other methods employed at the site.

I9-62 cont'd

The draft EIS/EIR must revise and re-circulated to include the necessary analysis and appropriate mitigation for the Project's impacts from noxious invasive plant species during all phases of the Project.

C. The Draft EIS/EIR Fails to Mitigate the Project's Potentially Significant Impacts to Special Status Species.

The draft EIS/EIR fails to adequately mitigate significant impacts to special status species, such as the American marten. Mitigation Measure WIL-3 is inadequate, as it cannot achieve its objective to ensure "no residual impacts" from Project construction are experienced by the species or its habitat.[341] The measure

I9-63

[336] *Id.*
[337] 40 C.F.R. § 1502.16(h).
[338] Draft EIS/EIR, at p. 2-55.
[339] *Id.*, at p. 3.3-1.
[340] Cashen Comments, p. 11.
[341] Draft EIS/EIR, p. 4.4-11.

merely requires the Applicant to retain as many snags, downed logs, coarse woody debris and brush piles "as possible." Scott Cashen concludes that even with the proposed mitigation the Project would result in continued habitat loss, fragmentation and anthropogenic disturbance for the American marten. Cashen recommends the Lead Agencies incorporate habitat compensation as a feasible and effective mitigation measure to reduce the Project's significant impacts to the American marten.

I9-63 cont'd

D. The Draft EIS/EIR Mitigation Measures Fails to Reduce the Project's Significant Impacts to Nesting Birds.

The Lead Agencies fail to analyze, or propose adequate measures to reduce, the Project's potentially significant impacts to nesting birds. As such, the Lead Agencies lack substantial evidence to conclude that the Project's potentially significant impacts to nesting birds have been reduced to a level of insignificance. To the contrary, unrefutted substantial evidence shows that the Project's impacts to nesting birds are potentially significant and unmitigated.[342]

As described by Mr. Cashen, the mitigation proposed is inadequate in several respects. First, the proposed mitigation measures are inadequate under CEQA because they are unenforceable and ineffective. The mitigation calls for a 500-foot buffer around identified bird nests *whenever possible*, but only requires nesting bird surveys within 250 feet of areas potentially affected by construction activities.[343] Second, the mitigation measures lack clear performance criteria.[344] Third, some bird species can build a nest and initiate egg-laying in less than fourteen days, the mitigation which allows pre-construction surveys more than 14 days prior to disturbance is ineffective.[345]

I9-64

E. The Draft EIS/EIR Fails to Mitigate the Impact on Wildlife from the Project's Sump Pits.

The draft EIS/EIR concludes Mitigation Measure WIL-2 will prevent wildlife from becoming trapped in the lined well site basins, which in turn will reduce impacts to special-status wildlife to a less than significant level.[346] Upon review,

I9-65

[342] Cashen Comments, p. 27.
[343] *Id.*
[344] *Id.*
[345] *Id.*
[346] Draft EIS/EIR, pp. 4.4-10 and 19.

Mr. Cashen finds the proposed mitigation is unsupported and inadequate to achieve its objectives.

First, the Lead Agencies may not rely on mitigation measure of unknown efficacy in concluding that a significant impact will be mitigated to a less than significant level. The mitigation proposes to remove water and other fluid from the basins as "operationally feasible", yet provides no definition or discussion regarding feasibility.[347] Consequently, the implementation of the mitigation is uncertain, and its effectiveness unreliable, which renders the measures inadequate under the law.

The draft EIS/EIR's discussion of mitigation measures must be supported by substantial evidence.[348] Unrebutted substantial evidence demonstrates that organisms' suffer ill-fated effects immediately upon contact with the type of fluids found in the basins.[349] Thus, as Cashen explains, the earthen "escape" ramps proposed by the measure fail to mitigate the adverse effects on wildlife to a less than significant level.[350] Moreover, "[a] mitigation measure cannot be used as a devise to avoid disclosing project impacts."[351] Presumably, the underlying purpose of lining the basins is to prevent hazardous fluids from contaminating the soil and groundwater. Given that context, it is unclear how the Applicant would be able to install *earthen* ramps that enable wildlife to escape, while not simultaneously exposing soil and groundwater resources to the hazardous fluids. This conflict must be disclosed and addressed in order to gauge the mitigation measures feasibility and potentially significant resulting impact. I9-65

Lastly, the proposed mitigation is inadequate in light of its failure to define the monitoring methods and mechanisms for enforcement, as well as specific performance criteria and triggers for remedial action.[352] Cashen recommends additional and/or more stringent, feasible mitigation measures, including a requirement that the sump pits are netted or screened to prevent access by wildlife.[353]

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[347] *Id.*, at p. 4.4-30.
[348] *San Joaquin Raptor Rescue Center v. County of Merced* (2007) 149 Cal.App.4th 645, 663-644.
[349] Cashen Comments, p. 25.
[350] *Ibid.*; *see also, Gentry v. city of Murrieta* (1995) 36 Cal. App.4th 1411 citing *Sacramento Old City Assn. v. City Council* (1991) 229 Ca.App.3d 1011, 1028-1029.
[351] *San Joaquin Raptor Rescue Center v. County of Merced* (2007) 149 Cal.App.4th 645, 663-644.
[352] Cashen Comments, p. 25.
[353] *Id.*, at p. 26.
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As such, the Lead Agencies lack the required substantial evidence to conclude the Project's impacts to wildlife from the Project's sump pits have been mitigated to a level of insignificance. The draft EIS/EIR must be revised and re-circulated. I9-65 cont'd

F. The Draft EIS/EIR Mitigation Measures Fails to Reduce the Project's Impacts to the Owens Tui Chub and the Hot Creek Fish Hatchery to a Level of Insignificance.

The lead agencies may not rely on a mitigation measure of unknown efficacy in concluding that a significant impact will be mitigated to a less than significant level. Deferral of environmental analysis is permissible only where the lead agency has adopted performance standards and makes approval further contingent on meeting the performance standards.[354] Deferral is impermissible when the agency "simply requires a project applicant to obtain a biological report and then comply with any recommendations that may be made in the report."[355]

The draft EIS/EIR concludes that the Project may result in potentially significant impacts to the Owens tui chub and the Hot Creek Fish Hatchery. The Lead Agencies propose to require the Applicant to comply with PDM GEO-5 and conclude that this measure will reduce the Project's potentially significant impacts to a less than significant level. Cashen finds several flaws with the draft EIS/EIR's mitigation. I9-66

PDM GEO-5 requires the Applicant to comply with existing hydrologic monitoring program under the oversight of the Long Valley Hydrologic Advisory Committee. The draft EIS/EIR is devoid of analysis regarding the efficacy of the existing mitigation regime.[356] Accordingly, there is no foundation for the draft EIS/EIRS's assumption that this mitigation will reduce impacts to below a level of significance. In fact, past experience demonstrates the monitoring program has been ineffective, as it has achieved no traction in reversing the decline of thermal water to the Hot Creek Headspring that began in 1993, or in preventing the significant decline in the Owens tui chub population associated with the decline in thermal water.[357] In addition, as discussed, the draft EIS/EIR includes no data regarding baseline conditions. The Lead Agencies have also failed to examine the

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[354] *Endangered Habitats League v. County of Orange* (4th Dist. 2005), 131 Cal.App.4th 777, 793-94.
[355] *Defend the Bay v. City of Irvine* (4th Dist. 2004) 119 Cal.App.4th 1261, 1275.
[356] Cashen Comment, pp. 28-29.
[357] *Id.*

magnitude of this Project's potentially significant impacts with respect to current conditions. PDM GEO-5 is also inadequate as a matter of law because it does not include specific, enforceable performance criteria. I9-66 cont'd

VII. THE EIS/EIR CUMULATIVE IMPACTS ANALYSIS IS INADEQUATE.

NEPA and CEQA both require a draft EIS/EIR to discuss a project's potential cumulative impacts.[358] The analysis requires consideration of the incremental impacts caused by a project, together with other past, present, and reasonably probable future projects, including projects outside of the lead agency's jurisdiction.[359] A cumulative impact is defined as one which is created as a result of the combination of the project evaluated in the EIR together with other projects causing related impacts."[360] The potentially significant impacts of the proposed Project must be considered in conjunction with the impacts from these other projects. I9-67

> [T]he statutory injunction to assess "the incremental effects of an individual project ... in connection with the effects of *past projects*, the effects of other current projects, and the effects of probable future projects" (Pub. Resources Code, § 21083, subd. (b)(2), italics added) signifies an obligation to consider the present project in the context of a realistic historical account of relevant prior activities that have had significant environmental impacts.[361]

Thus, a legally adequate "cumulative impacts analysis" views a particular project over time and in conjunction with other related past, present, and reasonably foreseeable, probable future projects whose impacts might compound or interrelate

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[358] 40 C.F.R. § 1508.7; Cal. Pub. Res. Code § 21083(b), CEQA Guidelines §§ 15130(b), 15355(b).).
[359] CEQA Guidelines, § 15064(h)(1); *see also* 15355, subd. (b) ["The cumulative impact from several projects is the change in the environment which results from the incremental impact of the project when added to other closely related past, present, and reasonably foreseeable probable future projects. Cumulative impacts can result from individually minor but collectively significant projects taking place over a period of time."]; see *also Los Angeles Unified School Dist. v. City of Los Angeles* (1997) 58 Cal.App.4th 1019, 1024-1025.
[360] CEQA Guidelines, § 15130 subd. (a)(1) (emphasis added); *see also*, C.F.R. 40 1508.7.
[361] *Environmental Protection Information Center v. California Dept. of Forestry and Fire Protection* (2008) 44 Cal.4th 459, 524 (emphasis in original).

with those of the project at hand.[362] A lead agency's cumulative impact analysis is invalid under CEQA if it fails to adequately reflect the severity and significance of a project's cumulative impacts.[363]

> The primary determination is whether it was reasonable and practical to include the projects and whether, without their inclusion, the severity and significance of the cumulative impacts were adequately reflected.[364]

"The disparity between what was considered and what was known is the basis upon which . . . [a court] will find abuse of discretion."[365]

I9-67 cont'd

Here, the draft EIS/EIR fails to present an adequate analysis of the Project's cumulative impacts for biological resources in light of the existing geothermal projects. The draft EIS/EIR also fails to account for the reasonably foreseeable future development at the Casa Diablo geothermal complex. Pursuant to the Geothermal Lease Act, the Project is proposed on land leased, issued jointly by the USFS and BLM to Ormat. In accordance with the Geothermal Steam Act, leasee is required to "diligently explore the leased lands for geothermal resources until there is production in commercial quantities."[366] From documentation submitted by Ormat in support of the Replacement Project Conditional Use Permit, Ormat has acquired "future rights to develop additional geothermal facilities on more than 10,000 acres of undeveloped federal land."[367] Development of these lands for geothermal exploration is reasonably foreseeable and should be considered in the cumulative impact analysis.

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[362] *See* CEQA Guidelines, § 15355 subd. (b) ("Cumulative impacts can result from individually minor but collectively significant projects taking place over a period of time"); *see also Communities for a Better Environment v. Cal. Resources Agency* (2002) 103 Cal.App.4th 98, 117.
[363] *See* CEQA Guidelines, § 15130 subd. (b); *see also San Franciscans for Reasonable Growth v. City and County of San Francisco* (1984) 151 Cal.App.3d 61, 72-73.
[364] *Kings County Farm Bureau v. City of Hanford* (1990) 221 Cal.App.3d 692, 723.
[365] *Id.*
[366] Draft EIS/EIR, p. 1-9.
[367] Ormat LLC's Supporting Documentation for MP1-Replacement Project Conditional Use Permit, submitted to Mono County Planning Department (Attachment -W).

A. The Draft EIS/EIR Impermissibly Defers Analysis of the Project's Cumulatively Considerable Impacts on Mule Deer.

Substantial evidence shows that the Project's impacts on mule deer may be cumulatively considerable.[368] The Project is located within a mule deer migration zone and that geothermal brine pipelines and other Project features may obstruct deer movement.[369] The Round Valley and Casa Diablo deer herds have and continue to experience ecosystem stress resulting in species decline.[370] Because the Project will affect foraging habitat, especially critical nutrients, such as bitterbrush, it will exacerbate current stresses that have led to the decline.[371] With the elimination of up to 80 acres of habitat within the holding/staging areas[372], the Project's contribution to this impact must be fully evaluated in a revised draft EIS/EIR. I9-68

B. The Draft EIS/EIR is Absent any Discussion or Analysis of the Project's Cumulative Impacts on the Owens Tui Chub and the Hot Creek Hatchery.

The draft EIS/EIR fails to include an analysis of the Project's cumulative impacts on the Owens tui chub and the Hot Creek Hatchery. The draft EIS/EIR's failure to consider the foreseeable expansive growth of the Casa Diablo geothermal complex in the analysis of the Project's cumulative impacts on biological resources is highly problematic. The Lead Agencies are required to consider the incremental impacts caused by the Project, together with other past, present, and reasonably probable future projects, including projects outside of the Lead Agencies jurisdiction.[373] The CEQA Guidelines instruct a cumulative impact is one, "which is I9-69

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[368] Bleich Comments, pp. 8-10.
[369] *See* Bleich Comments, pp. 9-10 (noting, Round Valley deer herd decline over the last 25 years has been substantial from 6,000 in 1985 to just barely 950 in 1990 with a small increase in 2009 to 1,900).
[370] *See* Bleich Comments, cumulative impacts section generally, pp. 8-12.
[371] Bleich Comments, p.9. (Belich notes that bitterbrush, is a staple in the deer's diet and highly vulnerable to cheatgrass invasions, which as discussed in section – is prevalent, improperly mitigation and potentially significant).
[372] Draft EIS/EIR, at p. 4.4-27.
[373] CEQA Guidelines, § 15064(h)(1); *see also* 15355 (b) ["The cumulative impact from several projects is the change in the environment which results from the incremental impact of the project when added to other closely related past, present, and reasonably foreseeable probable future projects.
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created as a result of the combination of the project evaluated in the EIR together with other projects causing related impacts."[374] The draft EIS/EIR's failure to determine the significance of Project impacts on the federally endangered Owens tui chub and the Hot Creek Hatchery is invalid as a matter of law.

I9-69 cont'd

VIII. THE PROJECT FAILS TO COMPLY WITH THE REQUIREMENTS SET FORTH IN THE CALIFORNIA WATER CODE.

The Project may not be approved until the Applicant demonstrates compliance with the California Water Code. Pursuant to section 10912 of the California Water Code, a Water Supply Assessment ("WSA") is required for the Project and must be included in the environmental review document circulated for public review and comment. If the Lead Agencies approve the Project without an adequate WSA, the approval will not only violate the Water Code, but it will also preclude the informed decision making required by CEQA regarding meaningful assessment of Project impacts.

I9-70

The provisions of the Water Code have been described as the "show me the water" law. The law requires the preparation of WSA's in order to "ensure that local land use authorities will thoroughly consider the availability of water supplies before approving major new developments."[375] When a lead agency prepares an environmental review document for a project under CEQA, and cannot identify a public water system that will serve the project, it must prepare the WSA.[376] The WSA must discuss whether the available water supplies will meet the project's water demand, in addition to existing and planned future water uses, including agricultural and manufacturing uses.[377] The WSA must also identify and describe the reliability of the water entitlements, water rights, or water service contracts that will be used to serve the project.[378] Additional information is required if the water supply for the project will include groundwater.[379] The WSA must describe

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Cumulative impacts can result from individually minor but collectively significant projects taking place over a period of time."]; see *also Los Angeles Unified School Dist. v. City of Los Angeles* (1997) 58 Cal.App.4th 1019, 1024-1025.

[374] CEQA Guidelines, § 15130 (a)(1) (emphasis added).

[375] *Vineyard Area Citizens for Responsible Growth, Inc. v. City of Rancho Cordova* (2007) 40 Cal.4th 412, 432.

[376] Water Code § 10910(b).

[377] *Id.*, subd. (c)(4).

[378] *Id.*, subds. (d), (e).

[379] *Id.* subd. (f).

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the groundwater basin that will supply water to the project, including whether the basin is overdrafted or is projected to become overdrafted.[380]

The geothermal power plant is clearly an industrial, manufacturing, or processing plant, over 40 acres, as it is a geothermal project with associated infrastructure on 80 acres of land. Thus, it requires a WSA under the plain language of the statute. The California Supreme Court has stated that the definition of a "project" that requires a WSA applies "broadly to *any* large land use project (not only residential developments) and to approval of any such project subject to CEQA."[381] The Water Code provides an exhaustive list of project types that require a WSA: residential, shopping center, business, commercial office, hotel, motel, industrial, manufacturing, processing, and mixed-use.[382]

The conclusion that the Project meets the definition of a "project" under the Water Code is supported by the court's recent interpretation of the statute in *Center for Biological Diversity v. City of San Bernardino*, which held that an open-air composting facility is a "project" under Water Code section 10912 if it meets the 40-acre threshold, "even if the only structures on site are small ones."[383] Like the composting facility in *Center for Biological Diversity*, the Project qualifies as a "project" under section 10912 because it is an "industrial, manufacturing, or processing plant" located on more than 40 acres of land. A WSA is therefore required.

Because the Project meets the definition of a "project" under the Water Code a WSA must be prepared and included in a revised and re-circulated draft EIS/EIR.

I9-70 cont'd

IX. THE EIS/EIR FAILS TO IDENTIFY THE PROJECT'S SIGNIFCANT LAND USE IMPACTS

A. The Project is inconsistent with the Mono County General Plan

I9-71

The draft EIS/EIR acknowledges that parts of the Project site are located on rural and forested areas in unincorporated County land.[384] The draft EIS/EIR then

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[380] *Id.* § 10912(a)(5).
[381] *Vineyard Area Citizens for Responsible Growth, Inc. v. City of Rancho Cordova* (2007) 40 Cal.4th 412, 433 (emphasis added).
[382] Water Code § 10912.
[383] *Center for Biological Diversity v. City of San Bernardino* (2010) 188 Cal. App. 4th 603.
[384] Draft EIS/EIR, p. 1-12-13.

goes on to find that the Project impacts to land use is insignificant and the Project is consistent with the general plan.[385] This conclusion is wholly unsupported.

Pursuant to California law, a general plan serves as a "charter for future development"[386] and embodies "fundamental land use decisions that guide the future growth and development of cities and counties."[387] The general plan has been described as "the constitution for all future developments" within a city or county.[388] The "propriety of virtually any local decision affecting land use and development depends upon consistency with the applicable general plan and its elements."[389] The consistency doctrine has been described as the "linchpin of California's land use and development laws; it is the principle which infuses the concept of planned growth with the force of law."[390] Consequently, land use decisions must be consistent with a city's general plan.[391]

I9-71 cont'd

A project is inconsistent, and may not be approved, "if it conflicts with a general plan policy that is fundamental, mandatory, and clear."[392] In, *Endangered Habitats League, Inc. v. County of Orange*, the court determine that a general plan policy establishing concrete levels of service for particular intersections was "fundamental, mandatory, and clear."[393] In that case, the relevant policy provided as follows:

> LOS C shall . . . be maintained on Santiago Canyon Road links until such time as uninterrupted segments of roadways (i.e. no major intersections) are reduced to less than three miles.[394]

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[385] *Id.*, at p. 4.10-3.
[386] *Lesher Communications, Inc. v. City of Walnut Creek* (1990) 52 Cal.3d 531, 54.
[387] *City of Santa Ana v. City of Garden Grove* (1979) 100 Cal.App.3d 521, 532.
[388] *Families Unafraid to Uphold Rural El Dorado County v. Board of Supervisors of El Dorado County* (1998) 62 Cal.App.4th 1334, 1335.
[389] The elements that must be included in every general plan include land use, circulation, housing, conservation, open-space, noise and safety. (Gov. Code § 65302.); *See also, Citizens of Goleta Valley v. Board of Supervisors of County of Santa Barbara* (1990) 52 Cal.3d 553, 570.
[390] *Corona-Norco Unified School District v. City of Corona* (1993) 17 Cal.App.4th 985, 994.
[391] *Id.*; Gov. Code § 65860(a).
[392] *See Endangered Habitats League, Inc. v. County of Orange* (2005) 131 Cal.App.4th 777, 782-83.
[393] 131 Cal.App.4th 777, 782-83.
[394] *Id.* at p. 783.

The policy further required compliance to be evaluated according to the county's traffic manual.[395]

Similarly, here the Project conflicts with the "fundamental, mandatory and clear" criteria set forth in the Mono County General Plan for analysis and mitigation of impacts to mule deer and hydrologic resources. The Mono County General Plan requires that the Applicant prepare a "site-specific deer study" preformed by a recognized deer biologist,[396] and a baseline data report to be included as part of the hydrologic and biologic resource monitoring plans that identifies *all significant hydrologic and biologic baseline information available for the Project area.*[397] Additionally, the General Plan requires the Applicant to prepare a written analysis of the impacts that the Project and other development projects may individually or cumulatively have on tree-kills.[398] As detailed in these comments, the Lead Agencies failed to require the Applicant to produce these analyses and thus the Project's inconsistent with and violates the General Plan.

I9-72 cont'd

B. The Project is Inconsistent with the Inyo National Forest Land and Resource Management Plan.

The Project is to be located on National Forest lands administered by the Inyo National Forest.[399] In accordance, with the National Forest Management Act ("NFMA"), the transmission line and new access roads require a Special Use Authorization permit and must be consistent with the applicable Standards and Guidelines set forth in the Inyo National Forest Land and Resource Management Plan ("LRMP").[400] Mandatory consistency is also required by the terms of BLM geothermal leases CACA 14407 and 14408, which contain a condition prohibiting geothermal development if the activity significantly affects the USFS management

I9-73

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[395] *Ibid.*
[396] *See* Attachment G Figure 1.
[397] *Ibid.*, at p. v-41 (emphasis added).
[398] *Id.*, at Goal 1.
[399] Draft EIS/EIR, p. 1-2.
[400] *See* 16 U.S.C. § 1604(g)(3); *see also* 36 C.F.R. § 219 et seq.; *Forest Guardians v. U.S. Forest Serv.*, 329 1098, 1092 (9th Cir. 2003); *see also, Buckingham v. Sec'y of USDA*, 602 F.3d 1073, 1077 (9th Cir. 2010); 36 C.F.R. § 219.10; *see also, Sierra Club, supra* 38 F.3d at 795 ("Site specific analysis ... must be consistent with the LRMP."); 16 U.S.C. § 1604(i) ("Resource plans and permits, contracts, and other instruments for the use and occupancy of National Forest System lands shall be consistent with the land management plans.") 36 C.F.R. §219.10(e) ("[T]he Forest Supervisor shall ensure that ... all outstanding and future permits, contracts, cooperative agreements, and other instruments for occupancy and use of affected lands are consistent with the plan.").

objectives for the land in question.[401] Several Project components, including the proposed pipelines and wells, are subject to these terms.[402] The draft EIS/EIR holds, "[t]he Proposed Action [is] consistent with the LRMP as it would not conflict with the management directions regarding applicable resource areas, such as geology, recreation, riparian areas, visual resources, and wildlife."[403] This conclusion is incorrect.

As articulated by the LRMP, the role of USFS is to "assure that impacts to resources are appropriately analyzed [and] ... impacts mitigated to the extent possible."[404] The Project falls within two designated management areas: "Mammoth" and "Upper Owens River".[405] Conformance within the affected management areas requires a project to:

I9-73 cont'd

> Manage riparian areas to maintain high habitat quality for fish, especially in threatened and endangered species waters, ...
>
> Maintain the productivity of meadows for sage grouse. Allow management activities that do not significantly interfere with key sage grouse habitat.
>
> Maintain or enhance the integrity of key winter ranges, holding areas, migration route, and fawning areas for mule deer. The USFS here has an additional responsibility to consider the location of fluid conveyance lines and facilities for geothermal development to ensure the "viability of deer migration corridors."[406]
>
> Maintain the productivity and resources of Hot Creek Fish Hatchery.[407]

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[401] Draft EIS/EIR, p. 1-7.
[402] *Ibid.*
[403] *Id.*, at p. 4.10-2.
[404] *Id.*, at p. 1-10 citing to the Inyo National Forest LMRP. (Attachment X).
[405] *Id.*, at p. 1-12.
[406] *Id.*, at p. 1-10 citing to the Inyo National Forest LMRP. (See, excerpts Attachment X)
[407] *Id.*, p. at 3.10-7, Table 3.10-1 and Table 3.10-2 Inyo National Forest LRMP Management Directions for Mammoth Management Area (#9) and Upper Owens River (#7) citing to the Inyo National Forest 1988 LRMP. (See, excerpts in Attachment X).

Under the NFMA, inconsistency can also result from the failure to fully explain adaptive management strategies proposed in furtherance of achieving the standards and objectives.[408] As detailed in these comments, the draft EIS/EIR is absent the necessary baseline information upon which to accurately assess the Project's impacts. However, with the information supplied in the draft EIS/EIR, biological resource experts Scott Cashen and Vern Bleich demonstrated that the Project would substantially interfere with sage-grouse habitat, impact migratory routes and staging areas for mule deer and significantly compromise the viability of the Hot Creek Fish Hatchery and the Owens tui chub.[409] Thus, the Project is inconsistent with and violates the LRMP.

I9-73 cont'd

X. CONCLUSION

The draft EIS/EIR fails as an informational document because it does not describe the Project, inform the public of the Project's environmental setting, contain the requisite "hard look" and adequately analyze the Project's impacts on air quality, biological resources, water resources, and geological resources among others. The draft EIS/EIR also does not propose feasible mitigation measures capable of reducing the Project's significant environmental effects. By failing to engage in formal consultation with the USFWS and integrate its review with the USFWS' requisite analysis, BLM is violating the ESA. Project approval would also violate the NFMA and the Inyo National Forest LRMP. Furthermore, the EIS/EIR is incapable of serving as the basis for the USFS's issuance of the necessary SUA permit for new access roads and the Project's transmission line. The Project further violates the CWA, as the Lead Agencies failed to properly identify WOUS and wetlands on the Project site, coordinate with the Corps or evaluate the Project's water quality impacts from access roads as a point source necessitating a NPDES permit.

I9-74

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[408] *Sequoia Forestkeeper v. U.S. Forest Serv.*, No. CV F 09-392 LJO JLT, 2010 WL 5059621, at *16-17 (2010) (determining whether special use permit issued by Forest Service contained conditions appropriate to protect and satisfy the Forest Plan goals).

[409] *See*, sections V and VI of this comment letter.

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For all reasons discussed here and in other comment letters on the draft EIS/EIR, the draft EIS/EIR must be withdrawn. The BLM must prepare a revised draft EIS/EIR that complies with all applicable laws and adequately analyzes and mitigates the Project's potentially significant environmental impacts.

Sincerely,

Pamela N. Epstein
Tanya A. Gulesserian

PNE:clv
Attachments

2632-021cv

Comments

Of the
California Unions for Reliable Energy

On
Joint Draft Environmental Impact Statement / Environmental Impact Report for ORNI 50 LLC's Casa Diablo IV Geothermal Development Project

Mono County

Prepared and Submitted
to the
U.S. Bureau of Land Management and the
Great Basin Unified Air Pollution Control District

ATTACHMENT A

January 29, 2013

RECEIVED
JAN 30 2013
GREAT BASIN UNIFIED APCD

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EXHIBIT A

Scott Cashen, M.S.—Independent Biological Resources and Forestry Consultant

January 28, 2013

Bureau of Land Management
Bishop Field Office
Attn: Collin Reinhardt
351 Pacu Lane, Suite 100
Bishop, CA 93514

Great Basin Unified Air Pollution Control District
Attn: Jan Sudoimer
157 Short Street
Bishop, CA 93514

Subject: Comments on the Draft Environmental Impact Statement and Draft Environmental Impact Report for the CD-IV Project

Dear Mr. Reinhardt and Ms. Sudoimer:

This letter contains my comments on the Draft Environmental Impact Statement and Draft Environmental Impact Report ("DEIS/DEIR") prepared for ORNI 50, LLC's ("Applicant") proposed CD-IV Project ("Project"). The Project involves the construction, operation, and eventual decommissioning of a new 33 net megawatt (MW) binary power plant. The Project also involves expanding the geothermal well field; constructing pipelines to bring the geothermal brine to the power plant and to take the cooled brine to injection wells; and installing an electric transmission line to interconnect the power plant to the Southern California Edison Substation at Substation Road.

I am an environmental biologist with 20 years of professional experience in wildlife ecology, forestry, and natural resource management. To date, I have served as a biological resources expert for over 50 projects, the majority of which have been renewable energy facilities. My experience in this regard includes assisting various clients with evaluations of biological resource issues, and testifying before the California Energy Commission and California Public Utilities Commission. My educational background includes a B.S. in Resource Management from the University of California at Berkeley, and a M.S. in Wildlife and Fisheries Science from the Pennsylvania State University.

I have gained particular knowledge of the biological resource issues associated with the Project through my work on other projects in the Sierra Nevada. The comments contained herein are based on this knowledge, as well as my review of the environmental documents prepared for the Project, a review of scientific literature pertaining to biological resources known to occur in Mono County, consultations with numerous biological resource experts, and the knowledge and experience I have acquired during more than 20 years of working in the field of natural resources management

3264 Hudson Avenue, Walnut Creek, CA 94597

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PROJECT DESCRIPTION

The DEIS/DEIR Lacks a Decommissioning Plan

The Applicant has yet to provide a Decommissioning Plan (also referred to as a Site Abandonment-Reclamation Plan) for the Project. Indeed, it is unclear when such a plan would be prepared. In one instance the DEIS/DEIR indicates the plan would be prepared prior to operation of the Project, whereas in other instances it indicates the plan would not be prepared until the end of power plant operations.[1] I9-75

Returning the Project site to pre-development conditions will require a dedicated effort that removes any degrading factors (e.g. soil erosion or contamination) and repairs the physical and/or chemical environment (as needed). The actions that are required to accomplish these tasks have the potential to cause significant impacts to biological resources. Because decommissioning is an anticipated phase of the Project, the Bureau of Land Management ("BLM") and the Great Basin Unified Air Pollution Control District ("GBUAPCD") must describe decommissioning activities so that Project impacts and the mitigation proposed in the DEIS/DEIR can be properly evaluated. I9-76

EXISTING CONDITIONS

The BLM, USFS, and GBUAPCD Do Not Have the Data Needed to Evaluate Project Alternatives

The BLM and U.S. Forest Service ("USFS") have identified Alternative 3 as the Preferred Alternative, and the GBUAPCD has identified Alternative 3 as the environmentally superior alternative.[2] The DEIS/DEIR indicates Project Alternatives 1, 2, and 3 would all have similar impacts on biological resources.[3] The BLM and GBUAPCD do not appear to have the basis for these conclusions because site-specific studies have not been conducted for Alternative 3, and they have not been completed for Alternative 2.[4] I9-77

The DEIS/DEIR's Description of the Jeffrey Pine Vegetation Community Is Too Vague to Understand Existing Conditions and Habitat Suitability for Sensitive Species

According to the DEIS/DEIR, wildlife habitats were categorized using the CDFG's *A Guide to Wildlife Habitats* (Mayer and Laudenslayer 1988).[5] This statement is not reflected in the habitat descriptions provided in the DEIS/DEIR. Mayer and Laudenslayer (1988) identify 24 distinct habitat stages of the Jeffrey Pine vegetation I9-78

[1] DEIS/DEIR, pp. 2-45, 4.3-8, 4.8-6.
[2] *Ibid*, p. 2-74.
[3] *Ibid*, Table 2-4.
[4] *Ibid*, Table 3.3-1.
[5] *Ibid*, p. 3.4-2.

community.[6] The DEIS/DEIR does not describe the habitat on the Project site according to this classification system. Instead, the DEIS/DEIR's description of the Jeffrey Pine vegetation community (one of the two dominant vegetation communities in the Project are) is limited to the statement that:

> Jeffrey pines (*Pinus jeffreyi*) exist in the Project area as the dominant overstory species, occurring in pure stands of various size second-growth, as well as scattered individual trees of various sizes.[7]

This description of the Jeffrey Pine vegetation community is too vague to convey the habitat types present on the Project site. For example, the Pacific fisher occurs in intermediate to large-tree stages of coniferous forests and deciduous-riparian habitats with a high percent canopy closure.[8] Based on the DEIS/DEIR's description of the Jeffrey Pine vegetation community, it is impossible to determine the extent of large and dense stands of Jeffrey pine on the Project site, and thus the extent of Project impacts to habitat for the Pacific fisher. The DEIS/DEIR must be revised such that it describes the specific habitat stages present on the Project site, as well as the abundance and distribution of the specific habitat types associated with the special-status species identified in Table 3.4-1 of the DEIS/DEIR.

I9-78 cont.

The DEIS/DEIR Fails to Provide a Sufficient Description of Sensitive Botanical Resources

The Applicant's consultant conducted special-status plant and noxious weed surveys within the immediate footprint for the geothermal power plant site, the geothermal well sites, and a 300-foot wide survey corridor for the pipeline routes.[9] Botanical surveys for the new access roads have not been conducted, although the DEIS/DEIR indicates they will be conducted during the spring and summer of 2013.[10]

I9-79

Most special-status plant species have specific microhabitat requirements. The Project has the potential to alter the microhabitat conditions near the Project site through shading, wind deflection, and changes to the local hydrology (among other possible changes).[11] It also has the potential to indirectly impact botanical resources through accidental trampling, vehicular activity, intrusion of non-native species, and fuel and chemical spills (among other potential indirect impacts). Focused botanical surveys of the buffer zones surrounding the potential power plant sites are essential to evaluating the potential indirect impacts of the Project on sensitive biological resources. The BLM and GBUAPCD's failure to document the presence, abundance, and distribution of special-

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[6] McBride JR. 1988. Jeffrey Pine. In: Mayer KE, WF Laudenslayer Jr., editors. A Guide to Wildlife Habitats of California. State of California, Resources Agency, Department of Fish and Game Sacramento, CA. 166 pp.

[7] *Ibid.*

[8] California Wildlife Habitat Relationships System. 2005. California Department of Fish and Game. California Interagency Wildlife Task Group. CWHR version 8.1 personal computer program. Sacramento (CA).

[9] DEIS/DEIR, p. 3.3-1.

[10] *Ibid.*

[11] Smith SD, DT Patten, RK Monson. 1987. Effects of artificially imposed shade on a Sonoran Desert ecosystem: microclimate and vegetation. Journal of Arid Environments 13:65–82.

status plant species in the Project buffer areas precludes the ability to fully evaluate Project impacts, and the ability to formulate appropriate mitigation. I9-79 cont.

The DEIS/DEIR Fails to Provide a Sufficient Description of Special-Status Wildlife

Several special-status wildlife species have the potential to occur on the Project site.[12] Nevertheless, focused biological surveys for special-status wildlife were not conducted for the Project.[13] Without a proper description of use of the site by special-status species, it is impossible to assess the Project's impacts, the various alternatives, and the adequacy of the proposed mitigation measures. The BLM and GBUAPCD must require protocol-level surveys for special-status wildlife and provide the survey results in a revised DEIS/DEIR. I9-80

Northern Goshawk

Focused surveys for the northern goshawk were not conducted for the Project, even though the Project site is within a protected activity center ("PAC") and five known northern goshawk nest sites have been identified in a portion of the Project area.[14] The Biological Evaluation that was prepared for the Project indicates northern goshawk "calls and nest surveys" were conducted during the spring and summer of 2010. The value of these surveys cannot be evaluated because the Biological Evaluation provides almost no information on the survey effort, including whether the surveys adhered to the USFS survey protocol. Furthermore, the DEIS/DEIR lacks the information needed to evaluate the severity of Project impacts on the northern goshawk because it does not provide baseline information on (a) the local and regional status of the northern goshawk; and (b) the number and status of PACs in the Inyo National Forest. I9-81

Greater Sage-Grouse

The Project area contains suitable habitat for the greater sage-grouse.[15] According to the DEIS/DEIR, sage-grouse habitat on the Project site is of "marginal quality due to the low density of the sagebrush, the presence of interspersed Jeffrey pines and the lack of herbaceous cover," and that "[s]age-grouse typically prefer dense, contiguous stands of sagebrush with little to no overstory."[16] These statements are unsubstantiated. They are also inconsistent with the DEIS/DEIR's description of the sagebrush scrub vegetation community on the Project site, with information provided by the Applicant's biological resources consultant, and with published literature pertaining to sage-grouse habitat.[17] I9-82

[12] DEIS/DEIR, Table 3.4-1.
[13] *Ibid*, p. 3.4-4.
[14] *Ibid*, p. 3.4-13.
[15] *Ibid*, p. 4.4-10.
[16] *Ibid.*
[17] *Ibid*, p. 3.3-4. See also Paulus J. 2001 Jun 18. Plant communities found at the Basalt Canyon Geothermal Exploration Survey Area. Letter to S. Kerns, Wildlands Resource Managers. Available from Mono County Planning Division. See also Connelly JW, ST Knick, MA Schroeder, SJ Stiver. 2004. Conservation Assessment of Greater Sage-grouse and Sagebrush Habitats. Western Association of Fish and Wildlife

For example, sage-grouse leks do not occur in dense stands of sagebrush. Instead, they are typically adjacent to sagebrush at a location that is characterized by low, sparse vegetation and higher amounts of bare ground than adjacent sites.[18]

There have been nine consistently counted active sage-grouse leks in Long Valley.[19] Conelly et al. (2000) suggests that for all non-migratory populations of sage-grouse, habitat within 3.2 km of known leks should be given a high priority for protection.[20] The Project's consistency with this recommendation cannot be evaluated because the DEIS/DEIR does not identify the distance between known leks and the Project site.

I9-82 cont.

Sage-grouse have been observed within a 0.25-mile distance from the southern edge of the Project area.[21] According to the DEIS/DEIR, surveys for possible sage-grouse nest and lek sites were conducted in June 2010, and no signs of sage-grouse were observed during those surveys. The DEIS/DEIR fails to provide any information pertaining to the surveys, including the survey methods and area. Consequently, it is impossible to assess the value of the surveys in providing evidence that sage-grouse were absent from the Project site in 2010.

American Marten

The Project site provides suitable habitat for the American marten, and the species has been detected in the vicinity of the Shady Rest Park in association with Jeffery pine stands.[22] According to the DEIS/DEIR, however, "the lack of dense, multi-storied, multi-species late seral conditions (abundant downed logs, snags and large diameter trees) make it unlikely marten use the area for denning, resting and/or sustained foraging."[23] This statement conflicts with the Management Indicator Species Report prepared for the Project, which indicates the Project site contains "Late Seral Closed Canopy Coniferous Forest" habitat, and that the Project would directly or indirectly affect habitat for the American marten.[24]

I9-83

The Biological Evaluation for the Project provides additional confusing information pertaining to the Project site's suitability as marten habitat. It states: "[m]arten are typically associated with true fir habitats with associated brush fields. Such habitat exists

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Agencies. Unpublished Report. Cheyenne, Wyoming. Available at: http://www.ndow.org/wild/conservation/sg/index.shtm.

[18] Connelly JW, ST Knick, MA Schroeder, SJ Stiver. 2004. Conservation Assessment of Greater Sage-grouse and Sagebrush Habitats. Western Association of Fish and Wildlife Agencies. Unpublished Report. Cheyenne, Wyoming. Available at: http://www.ndow.org/wild/conservation/sg/index.shtm.

[19] Bi-State Sage-grouse Conservation Team. 2004. Greater sage-grouse conservation plan for Nevada and eastern California. First edition. Available at: http://www.ndow.org/wild/sg/plan/SGPlan063004.pdf

[20] Connelly, J. W., M. A. Schroeder, A. R. Sands, and C. E. Braun. 2000. Guidelines to manage sage-grouse populations and their habitats. Wildlife Society Bulletin. 28:967-985.

[21] DEIS/DEIR, p. 3.4-14.

[22] *Ibid*, Table 3.4-1. See also Biological Evaluation, p. 25.

[23] *Ibid*, p. 4.4-11.

[24] MACTEC. 2010. Draft Project Management Indicator Species Report: Casa Diablo IV Geothermal Development Project, Table 1.

only in the northwestern edge of the Project area."[25] This statement is not substantiated by a citation, and I am unaware of any literature that has concluded marten are typically associated with true fir habitats and brush fields. According to the California Department of Fish and Wildlife ("CDFW"): (a) "[i]mportant habitats [for marten] include red fir, lodgepole pine, subalpine conifer, mixed conifer, Jeffrey pine, and eastside pine;" and (b) there is "[l]ittle information available on the interspersion of habitats required by this species."[26] I9-83

The inconsistent and incorrect information presented in the DEIS/DEIR and accompanying documents make it impossible to understand the amount and quality of American marten habitat in the Project area.

Sierra Nevada Red Fox and Pacific Fisher

The Sierra Nevada red fox is listed as threatened under the California Endangered Species Act. The Pacific fisher is a candidate for listing under the federal Endangered Species Act. Both of these species have the potential to occur on the Project site.[27] I9-84

Special survey techniques are required to detect the presence of the Sierra Nevada red fox, Pacific fisher, and American marten.[28] The Applicant did not implement these survey techniques. As a result, one must assume these species occur on the Project site.

Pallid Bat

The DEIS/DEIR provides inconsistent information on the potential for pallid bat roosts on the Project site. It first states that "[s]uitable foraging habitat exists across the Project site and suitable roosting habitat exists within the Jeffery pine forest along the northern boundary of the Project site. The species is thought to be present in the vicinity of the Project site based on habitat suitability."[29] However, it subsequently states "[s]uitable roosting habitats such as cliffs (pallid bat) and caves (Townsend's big-eared bat) are not found within the project area."[30] According to the Biological Evaluation, "[t]he key components of habitat for the pallid bat consist of open foraging opportunities in combination with suitable roost areas in association with water."[31] These conditions are present in the Project area. The lack of any focused surveys for bat roosts, in conjunction with the inconsistent information provided in the DEIS/DEIR and supporting documents, I9-85

[25] CD-IV Biological Evaluation, p. 43.
[26] California Wildlife Habitat Relationships System. 2005. California Department of Fish and Game. California Interagency Wildlife Task Group. CWHR version 8.1 personal computer program. Sacramento (CA).
[27] DEIS/DEIR, Table 3.4-1.
[28] Zielinski WJ, TE Kucera [technical editors]. 1995. American marten, fisher, lynx, and wolverine : survey methods for their detection. U.S. Dept. of Agriculture, Forest Service, Pacific Southwest Research Station. Albany, California.
[29] DEIS/DEIR, p. 3.4-15.
[30] *Ibid*, p. 4.4-10.
[31] Biological Evaluation, p. 23.

makes it impossible to evaluate Project impacts to the pallid bat and other special-status bat species. I9-85 cont.

The DEIS/DEIS Fails to Accurately Disclose Wetlands and Jurisdictional Waters

Dr. Paulus, the Applicant's consultant, conducted an assessment of wetlands and riverine resources at the Project site in 2012. The DEIS/DEIR misrepresents the information presented in Paulus's assessment, and the extent of jurisdictional waters in the Project area. I9-86

First, the DEIS/DEIR indicates, "[a] total of 1.89 acres of potentially jurisdictional wetlands were mapped within the Project area, all in close proximity to the existing power plant facilities."[32] This statement is incorrect. Paulus mapped 1.89 acres of wetland vegetation alliances, which do not necessarily reflect the total extent of jurisdictional wetlands in the Project area.[33] I9-87

Second, the DEIS/DEIR incorrectly reports the Riparian Conservation Area ("RCA") corridors in the Upper Basalt and Basalt Canyon areas do not support stream channels.[34] Although discontinuous, stream channels are present in the Upper Basalt and Basalt Canyon areas.[35] Indeed, Paulus reported a channel that originates at Shady Rest Park.[36] One of the pipelines proposed for the Project would cross that channel.[37] I9-88

Third, the DEIS/DEIR states "[t]he assessment performed by Paulus (Paulus, 2012) determined that the 'blue line' drainages were likely not jurisdictional under the CWA [Clean Water Act] except for in the area of the existing power plants."[38] The U.S. Army Corps of Engineers makes each jurisdictional determination on a case-by-case basis considering the facts and circumstances of the case and consistent with applicable statutes, regulations, and case law. The actual extent of waters of the U.S. cannot be determined until Paulus's wetland delineation has been verified by the U.S. Army Corps of Engineers. I9-89

Finally, and most importantly, the DEIS/DEIR fails to map or otherwise disclose the extent of other waters of the U.S. (i.e., "(a)(3) waters"), waters of the State, and aquatic habitats subject to regulation under Section 1602 of Fish and Game Code. These features appear to be present in the Project area. For example, the DEIS/DEIR indicates erosion control measures will be implemented where sediment run-off threatens "Waters of the State," and Paulus reported the presence of wetland vegetation and hydrology at an I9-90

[32] DEIS/DEIR, p. 3.3-11.
[33] Paulus J. 2012. Investigation of Riverine Resources Including Wetlands at the Proposed CD4 Project, Mammoth Lakes, California, Table 1.
[34] DEIS/DEIR, p. 3.3-18.
[35] Paulus J. 2012. Investigation of Riverine Resources Including Wetlands at the Proposed CD4 Project, Mammoth Lakes, California, p. 12 and Appendix D.
[36] *Ibid.*
[37] *Ibid.*
[38] DEIS/DEIR, p. 3.3-11.

internally drained basin 600 ft north of proposed well pad 34-25.[39] The BLM and GBUAPCD must prepare a revised DEIS/DEIR that identifies, quantifies, and maps the presence of all jurisdictional features in relation to Project infrastructure so that the public and decision makers can evaluate Project impacts, the adequacy of the proposed mitigation, and the Project's compliance with state and federal water quality regulations.

I9-90 cont.

The DEIS/DEIR Fails to Establish Baseline Conditions with Respect to the Owens Tui Chub

The Owens tui chub is a subspecies of fish that is listed as endangered under the state and federal Endangered Species Acts. It is an extremely rare subspecies that is known to occur at only six isolated locations.[40] The headwaters of Hot Creek above the Hot Creek Fish Hatchery is one of only two locations where the Owens tui chub occurs in its native habitat (the remaining four populations are located in manmade impoundments).[41]

The Hot Creek Headsprings (or Headwaters) site consists of two springs, "AB Spring" and "CD Spring." It is located approximately two miles east of the Project site, and it is one of two sites that the U.S. Fish and Wildlife ("USFWS") has designated as critical habitat for the subspecies.

The DEIS/DEIR provides a generalized description of the habitat and biology associated with the Owens tui chub. However, it fails to provide three critical pieces of data:

1. Population data. The BLM and GBUAPCD's fail to establish the current size and trend of the Owens tui chub populations in the Hot Creek Headsprings. This precludes the ability to analyze the population's response to Project-induced changes in habitat (e.g., water temperature). It also precludes the ability to devise an objective and meaningful trigger for adaptive management.

I9-91

2. Hydrologic data. The United States Geological Survey ("USGS") has been collecting hydrologic monitoring data at Hot Creek since the 1980s. Some of these data pertain to habitat conditions in the Hot Creek Headsprings. To establish existing conditions, the BLM and GBUAPCD must disclose these data in a revised DEIS/DEIR.

3. Habitat data. Several habitat variables are believed to influence Owens tui chub populations. These include the prey base, cover, water quality, water chemistry (e.g., pH, dissolved gases), and presence of predators (among other variables). The DEIS/DEIR does not quantify existing conditions pertaining to these habitat variables. This precludes the ability to determine whether a change in the Owens tui chub population is due to a Project-induced change in habitat (e.g., water temperature), or a change in habitat that is unrelated to the Project (e.g., increase in predator density).

[39] *Ibid*, p. 4.3-18. See also CD IV Wetlands, Appendix D, Plate D-18.
[40] US Fish and Wildlife Service. 2009. Owens Tui Chub: 5-Year Review and Evaluation.
[41] *Ibid.*

The DEIS/DEIR's failure to disclose and incorporate fundamental baseline data results in significant flaws with the DEIS/DEIR's description of the environmental setting and its analysis of Project impacts to biological resources. Indeed, Mono County has acknowledged comprehensive baseline data are needed to evaluate proposed geothermal development projects. Specifically, the Mono County General Plan states: "[t]he applicant for a geothermal development permit shall prepare a baseline data report to be included as part of the hydrologic and biologic resource monitoring plans that identifies all significant hydrologic and biologic baseline information available for the project area."[42]

I9-91 cont.

The DEIR Fails to Disclose or Address the Project's Potentially Significant Impacts on Tree-Kills

Since 2006, scientists with the USGS have been conducting research at tree-kill sites near Casa Diablo. Their research has led them to the following inferences and conclusions:

1. "[m]any of these kills occurred during the mid-1990s and were associated with early power-plant operations at Casa Diablo (Bergfeld and others, 2006)."[43]
2. "[o]ur findings indicate that the [new tree-kill] areas have developed as a response to changes in the shallow hydrologic system. Some of the changes are likely related to fluid production at the power plant, but at distal sites the changes are more likely related to seismicity and uplift of the dome."[44]
3. "changes in the size of kill zones, increases in soil temperatures or steam discharge, and changes in CO_2 emissions most likely reflect the response of the shallow hydrothermal system to geothermal fluid production at the Casa Diablo power plant."[45]
4. "[o]ur early work (Bergfeld and others, 2006) indicated that about 8.7 metric tonnes of CO_2 per day (t/d) were emitted from these kill zones, with the highest discharge occurring in areas within a few km of the Casa Diablo geothermal power plant, and that most of the kill zones developed as a response to changing conditions in the shallow hydrothermal system."[46]
5. "[w]ithout sufficient pressure support, the shallow hydrothermal system [at Shady Rest] would respond to the 2006 onset of fluid production at the 5725

I9-92

[42] County of Mono Community Development Department. 2010. Mono County General Plan. Bridgeport, CA. (Drafted July 1997 and Revised 2010). Conservation /Open Space Element-2010, p. V-41. [emphasis added].

[43] Bergfeld D, WC Evans. 2011, Monitoring CO_2 emissions in tree kill areas near the resurgent dome at Long Valley Caldera, California: U.S. Geological Survey Scientifie Investigations Report 2011-5038, p. 5.

[44] Bergfeld D, WC Evans, JF Howle, CD Farrar. 2006. Carbon Dioxide Emissions from Vegetation-Kill Zones Around the Resurgent Dome of Long Valley Caldera, Eastern California US A. Journal of Volcanology and Geothermal Research 152 (2006): 140-156. Abstract available at: www.sciencedirect.com/science/artiele/pii/S0377027305003550.

[45] Bergfeld D, WC Evans.2011, Monitoring CO_2 emissions in tree kill areas near the resurgent dome at Long Valley Caldera, California: U.S. Geological Survey Scientific Investigations Report 2011-5038, p. 1.

[46] *Ibid.*

and 6625 wells. Variations in CO_2 emissions since that time may reflect adjustments in the shallow reservoir to the fluid production."[47]

6. "[t]he presence of isobutane in gas samples at Basalt Canyon shows that volatiles from the injectate have reached the underlying area. The pressure support provided by the injectate would stabilize the depth of boiling in the reservoir and, consequently, would control the upflow of steam and CO_2, producing more constant CO_2 emissions."[48]
7. "[t]he presence of isobutane in gas samples from sites in and around Basalt Canyon suggests that geothermal fluid production directly effects fluid upflow in the region close to the power plant."[49]
8. "[t]he appearance of this gas [H_2S] at the surface may signal increased drawdown of water levels near the geothermal productions wells."[50]

I9-92 cont.

Based on the information provided above, there is ample scientific evidence that the Project would contribute to additional tree kills. Specifically, because the continued expansion of the tree-kill sites has been highly correlated with geothermal resource extraction, one can infer that an increase in geothermal resource extraction would contribute to additional expansions of the tree-kills (and possibly new tree-kill sites). The DEIS/DEIR fails to disclose, analyze, or provide mitigation for this potentially significant impact.

PROJECT IMPACTS

The DEIS/DEIR Lacks An Accurate Assessment of Project Impacts During Decommissioning

The DEIS/DEIR concludes there would be no impacts to special-status plants and wildlife due to decommissioning activities.[51] This conclusion is unjustified. As the DEIS/DEIR acknowledges, potential direct and indirect effects to biological resources during decommissioning are similar to those associated with the construction phase of the Project. These effects include ground disturbance, noise, light, fugitive dust, and the introduction or spread of noxious weeds.[52]

I9-93

Decommissioning activities have the potential to cause significant impacts to any special-status plant and animal species that colonize or re-colonize the Project site during the 30-year lifespan of the Project. Focused plant and animal surveys prior to decommissioning are required to determine the potential for significant impacts to special-status species during the decommissioning process.

[47] *Ibid*, p. 9.
[48] *Ibid*, p. 8.
[49] *Ibid*, p. 1.
[50] *Ibid.*
[51] DEIS/DEIR, pp. 4.3-9 and 4.4-20.
[52] *Ibid*, p. 4.3-10 and 4.4-8.

Vegetation Resources

Invasive Plants

The DEIS/DEIR does not consider chemical control as a means of containing and controlling noxious weeds at the Project site because, according to the DEIS/DEIR, "site specific information on target weed species are not known at this time."[53] The stated rationale is confusing because noxious weed surveys were conducted for the Project.[54] Nevertheless, there are two implications of the DEIS/DEIR not considering chemical control methods. I9-94

First, herbicides can have direct and indirect impacts on non-target organisms. If herbicides may be used for the Project, the DEIS/DEIR must identify the specific herbicides that will be (or may be) used, and it must analyze the potentially significant impacts of those herbicides on the environment. I9-95

Second, application of herbicides may be the only feasible means of controlling some noxious weed species. If herbicides will not be used, the DEIS/DEIR must establish the efficacy of other methods (e.g., manual removal) in controlling the noxious weed species that occur (or may occur) in the Project area. I9-96

The maintenance of access roads both within and outside the Project site boundary has the potential to introduce invasive plant species into disturbed areas and facilitate the spread of noxious weeds.[55] Vehicles and crews inadvertently could track in clinging seeds and/or parts of noxious weeds, thus facilitating their spread.[56] However, the DEIS/DEIR concludes the application of PDMs BIO-4, BIO-5, BIO-6, BIO-7, and BIO-8 would reduce these impacts.[57] The DEIS/DEIR lacks the basis for this conclusion because the referenced mitigation measures apply to the Project construction phase only, and they do not address the spread of noxious weeds during the operation and maintenance phase, or during decommissioning. I9-97

Special-Status Plants

The significance of Project impacts to special-status plants cannot be evaluated until focused botanical resources surveys have been completed for all areas that may be directly or indirectly affected by the Project. This includes the areas that may be directly or indirectly affected by Alternative 3, the new and reconstructed access roads, and the buffer zones surrounding the potential power plant sites. Although the DEIS/DEIR suggests some of these surveys will be conducted during the spring and summer of 2013, it does not incorporate the surveys as a required mitigation measure, and it does not A9-98

[53] *Ibid*, p. 2-55.
[54] *Ibid*, p. 3.3-1.
[55] *Ibid*, p. 4.3-10.
[56] *Ibid.*
[57] *Ibid.*

identify the mitigation measures that would be implemented if special-status species are detected during the surveys. I9-98 cont.

The DEIS/DEIR Fails to Disclose and Assess Impacts from the Project's Sump Pits

A dead northern goshawk was found at a well site in the Project area. According to the Project's Biological Evaluation, the goshawk apparently died from drowning in the well pad sump pit.[58] The DEIS/DEIR goes on to suggest the goshawk drowned because the steep slopes of the sump pit trapped the goshawk.[59] It is extremely unlikely that a bird species adept at flying would become trapped in the sump pit. Instead, it is much more likely the goshawk died due to contact with chemicals in the pit.

Hydraulic fracturing fluids and other hazardous materials will be used at the Project well sites, and presumably they have been used at the existing well sites.[60] These materials include (or may include) diesel fuel-powered equipment, drilling mud additives such as gel, polymers and slurry (which may contain small quantities of crystalline silica), miscellaneous lubricants, and solvents.[61] Hydraulic fracturing fluids can contain chemicals (e.g., surfactants, hydrochloric acid, caustic potash, and diesel fuel) that may enter the sump pit where they are harmful to wildlife.[62] Insects entrapped in sump pit fluids attract songbirds, bats, amphibians, and small mammals.[63] The struggling birds or small mammals in turn attract hawks and owls to the pit.[64] I9-99

The sump pits create an attractive hazard on the site because birds and other wildlife will mistake the sump pits for bodies of water.[65] If the sump pits contains oil, condensates, or other hydrocarbons or hydraulic fracturing fluids, the risk of bird mortality is very high.[66] The sticky nature of oil entraps birds in the sump pits, where they die from exposure and exhaustion.[67] Birds that manage to escape die from starvation, exposure, or the toxic effects of oil ingested during preening.[68] Birds ingesting sublethal doses of oil can experience impaired reproduction.[69] Cold stress can kill the animal if oil damages the insulation provided by feathers or fur.[70] Animals not killed in the sump pits can suffer ill effects later from contact with the oil and chemicals in the pits.[71] If they absorb or ingest oil in less than acutely lethal amounts they may suffer a variety of systemic effects and

[58] CD-IV Biological Evaluation, p. 17.
[59] DEIS/DEIR, pp. 4.4-9 and -10.
[60] *Ibid*, p. 3.13-2.
[61] *Ibid.*
[62] Ramirez P Jr. 2009. Reserve Pit Management: Risk to Migratory Birds. U.S. Fish and Wildlife Service Region 6, Cheyenne, Wyoming. 32 pp.
[63] *Ibid.*
[64] *Ibid.*
[65] *Ibid.*
[66] *Ibid.*
[67] *Ibid.*
[68] *Ibid.*
[69] *Ibid.*
[70] *Ibid.*
[71] *Ibid.*

may become more susceptible to disease and predation.[72] During the breeding season, birds can transfer oil from their feet and feathers to their eggs.[73] In some cases, a few drops of oil on an eggshell can kill the embryo.[74]

I9-99 cont.

The DEIS/DEIR must disclose these hazards to the public and decision makers. It also must identify the specific chemicals that may enter the sump pits so the hazard to wildlife can be properly assessed, and so effective mitigation strategies can be devised.

Special-Status Wildlife

Northern Goshawk

The DEIS/DEIR fails to identify the location of Project activities (e.g., tree removal and road construction) in relation to the five northern goshawk nest sites that occur in the Project area. This information is essential to evaluating the types and severity of Project impacts to the species.

Northern goshawks exhibit ecological characteristics of species that may be particularly sensitive to forest management practices that reduce or fragment habitat.[75] Nevertheless, the DEIS/DEIR lacks any discussion or analysis of the effects of habitat fragmentation on the northern goshawk. Forest management that fragments and reduces the extent and area of stands suitable for nesting in a breeding area may result in its less consistent use for nesting over time.[76] In addition, increased forest fragmentation will likely increase competition and predation on goshawk populations. Habitat generalists and species better adapted to more open woodlands such as corvids and other raptors (hawks and owls) can displace goshawks, compete for nesting structures, deplete the prey base, and depredate nests and adults.[77]

I9-100

The Biological Evaluation concluded that the Project may affect an individual goshawk's ability to forage in the area of construction, primarily in the northwest portion, but is not likely to result in a trend toward federal listing or loss of viability.[78] This is not a

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[72] *Ibid.*
[73] *Ibid.*
[74] *Ibid.*
[75] US Forest Service, Pacific Southwest Research Station. 2011. Northern Goshawk: Habitat Conservation Assessment for California [research project summary]. Available at: http://www.fs.fed.us/psw/topics/ecosystem_processes/sierra/bio_diversity/biodiversity_sub6/northern_goshawk.shtml.
[76] Woodbridge, B. and P.J. Detrich. 1994. Territory occupancy and habitat patch size of northern goshawks in the southern Cascades of California. Studies in Avian Biology 16: 83-87. See also Desimone, S.M. 1997. Occupancy rates and habitat relationships of northern goshawks in historic nesting areas in Oregon. M.S. Thesis, Oregon State University, Corvallis, OR.
[77] Crocker-Bedford, D. C. 1998. The value of demographic and habitat studies in determining the status of Northern Goshawks (*Accipiter gentilis atricapillus*) with special reference to Crocker-Bedford (1990) and Kennedy (1997). Journal of Raptor Research 32: 329-336. See also Patla, S. M. 1997. Nesting ecology and habitat of the Northern Goshawk in undisturbed and timber harvest areas on the Targhee National Forest, Greater Yellowstone Ecosystem. M. S. thesis, Idaho State University, Pocatello, Idaho.
[78] DEIS/DEIR, p. 4.4-9.

meaningful comparison due to massive differences in the two scopes of analysis (i.e., the local impact in relation to the national population). The DEIS/DEIR must assess the significance of Project impacts to the northern goshawk at the local or regional level, and then evaluate how impacts to the local or regional population may affect the statewide or national population. Furthermore, any analysis of the Project's contribution toward federal listing or loss of viability must consider the cumulative projects within the entire country (i.e., the projects that may cumulatively result in federal listing).

I9-100 cont.

The Project will impact a goshawk PAC by causing habitat loss and fragmentation. The DEIS/DEIR lacks any compensatory mitigation for this impact. As a result, the Project would have an unmitigated, significant impact on the northern goshawk.

Greater Sage-Grouse

The DEIS/DEIR concludes direct effects to nesting sage-grouse would be minimal due to the marginal quality and limited availability of suitable nesting habitat in the Project area.[79] As discussed previously, scientific literature and Paulus's survey reports do not indicate habitat is "marginal" or "limited."

I9-101

The Biological Evaluation concluded that the Project may affect individual sage-grouse, but it would not likely result in a trend toward federal listing or loss of viability.[80] Similarly, the Management Indicator Species Report concluded that the Project is not expected to have a significant direct, indirect or cumulative effect on greater sage-grouse habitat in the Project Area.[81] It stated the loss of approximately 39.56 acres of sagebrush habitat will not alter the existing bioregional trend for sagebrush habitat in the Project area nor will it lead to a change in the distribution of greater sage-grouse across the Sierra Nevada bioregion.[82] These conclusions lack scientific support.

First, the loss and fragmentation of sagebrush habitats has been cited as a primary cause for the decline of sage-grouse populations.[83] Mechanisms for declining populations from habitat fragmentation, which is largely a result of human activities, include reductions in lek persistence, lek attendance, population recruitment, yearling and adult annual survival, female nest site selection, nest initiation, and complete loss of leks and winter habitat.[84] Functional habitat loss also contributes to habitat fragmentation as greater sage-grouse avoid areas due to human activities, including noise, even though sagebrush remains intact.[85] In an analysis of population connectivity, Knick and Hanser (2011) demonstrated that in some areas of the sage-grouse range, populations are already

I9-102

[79] *Ibid*, p. 4.4-10.
[80] *Ibid.*
[81] *Ibid.*
[82] *Ibid.*
[83] See literature cited in: Sage-Grouse Conservation Objectives Team. 2012 Aug 1. Sage-Grouse Conservation Objectives Draft Report. Available at: http://www.fws.gov/mountain-prairie/species/birds/sagegrouse/.
[84] *Ibid.*
[85] Blickley, J. L., D. Blackwood and G. L. Patricelli. 2012. Experimental evidence for the effects of chronic anthropogenic noise on abundance of greater sage-grouse leks. Conservation Biology 26:461-471.

isolated and at risk for extirpation due to genetic, demographic, and stochastic (i.e., unpredictable) events.[86] Habitat loss and fragmentation contribute to the population's isolation and increased risk of extirpation. As the DEIS/DEIR acknowledges, "[t]he highways and existing geothermal development are now significant barriers to [sage-grouse] emigration from the known local use areas."[87] Additional development due to the Project would exacerbate these issues and would increase the risk of local extirpation. I9-102 cont.

Second, the DEIS/DEIR's impact assessment fails to consider the effects of the Project's transmission line, roads, and fencing. The construction of transmission lines, roads, and fences are known to be risks to sage-grouse in the South Mono PMU (Population Management Unit), and these features affect habitat quantity and populations on a yearlong basis.[88] I9-103

Third, the Project's effect on the distribution of greater sage-grouse across the entire Sierra Nevada bioregion it is not a meaningful level of analysis. The DEIS/DEIR must assess the significance of Project impacts to the South Mono PMU. I9-104

Ultimately the DEIS/DEIR concludes that the implementation of Mitigation Measure WIL-7 (pre-construction surveys for leks) would ensure that there are no residual impacts to sage-grouse.[89] I disagree with this conclusion because the mitigation measure does nothing to mitigate (a) the loss and degradation of sage-grouse habitat; or (b) the adverse effects of the Project's transmission line, roads, and fencing. I9-105

Forest Carnivores

The Project has the potential to cause the direct take of the Sierra Nevada red fox, Pacific fisher, and American marten (e.g., through destruction of den sites). It also has the potential to cause the indirect take of these species by displacing individuals out of their home range(s). These impacts would be extremely significant, especially to the Sierra Nevada red fox and Pacific fisher, which are extremely rare. The Sierra Nevada red fox, Pacific fisher, and American marten are rarely detected unless specialized survey techniques are used (e.g., remote cameras). As a result, the pre-construction survey proposed in the DEIS/DEIR is not an appropriate take avoidance strategy. I9-106

The DEIS/DEIR states Mitigation Measure WIL-3 will improve the quality of the habitat for the American marten, and that "there should be no residual impacts to American marten habitat from construction of the Proposed Action."[90] This statement is unjustified. Mitigation Measure WIL-3 requires the Applicant to retain as many snags,

[86] Knick, S.T. and S.E. Hanser. 2011. Connecting pattern and process in greater sage-grousepopulations and sagebrush landscapes. Pp. 383 – 406 in S.T. Knick and J.W. Connelly (editors). Greater Sage-Grouse: ecology and conservation of a landscape species and its habitats. Studies in Avian biology (vol. 38). University of California Press, Berkeley,CA.
[87] DEIS/DEIR, p. 4.4-10.
[88] Bi-State Sage-grouse Conservation Team. 2004. Greater sage-grouse conservation plan for Nevada and eastern California. First edition. Available at: http://www.ndow.org/wild/sg/plan/SGPlan063004.pdf
[89] DEIS/DEIR, p. 4.4-10.
[90] *Ibid*, p. 4.4-11.

downed logs, coarse woody debris and brush piles "as possible;" it does nothing to improve habitat as stipulated in the DEIS/DEIR. To the contrary, the habitat loss, fragmentation, and anthropogenic disturbance caused by the Project would degrade habitat for the American marten and Pacific fisher. The DEIS/DEIR lacks any mitigation (i.e., habitat compensation) for this significant impact.

The DEIS/DEIR acknowledges that the Project "is anticipated to result in temporary and/or permanent impacts to individuals or habitat of northern goshawk, greater sage-grouse, pallid bat, Townsend's big-eared bat, and Sierra marten. Under CEQA, these impacts would be considered significant."[91] Because the DEIS/DEIR does not provide mitigation to offset these impacts, the Project would result in unmitigated, significant impacts to special-status wildlife.

I9-106 cont.

Pallid Bat

The DEIS/DEIR states "[n]o bat roosts are known to occur within or adjacent to the Proposed Action; therefore, impacts to bat roosts are not anticipated."[92] This statement is unfounded because focused surveys to locate bat roosts were not conducted for the Project, and the DEIS/DEIR lacks evidence that surveys for bat roosts have ever been conducted in the Project area.

I9-107

The DEIS/DEIR Does Not Provide an Accurate Assessment of Project Impacts to Wetlands and Jurisdictional Waters

The DEIS/DEIR describes the impact analysis process that was applied to wetland and other jurisdictional waters as the following:

> [t]o determine the potential for construction and operations activities to cause direct effects on federal and state jurisdictional wetlands and waters of the U.S. the proposed construction areas were compared with maps of these features. Potential indirect effects were identified through the same means.[93]

The DEIS/DEIR subsequently concludes:

I9-108

> [d]irect impacts to potentially jurisdictional features in the study area are not expected. Project facilities are not planned for those areas identified during vegetation surveys that support vegetation typically associated with wetlands. RCAs in the study area will be avoided through implementation of PDM HYD-2, which requires pipelines and access roadways to be located outside of any delineated RCAs.[94]

The DEIS/DEIR does not provide any maps of waters of the State in the Project area. It also does not provide any maps that depict the locations of Project features in relation to waters of the U.S. This makes it extremely difficult for the public and decision makers to

[91] *Ibid*, p. 4.4-19.
[92] *Ibid.*
[93] *Ibid*, p. 4.3-2.
[94] *Ibid*, p. 4.3-8.

evaluate Project impacts to jurisdictional features, or to verify the conclusions presented in the DEIS/DEIR.

I used a geographic information system to overlay the map of Project features on the maps provided in Paulus's wetland delineation report. The resulting maps do not support the statements that (a) Project facilities are not planned for areas that support vegetation typically associated with wetlands; and (b) pipelines and access roadways would be located outside of any delineated Riparian Conservation Areas ("RCAs").[95] To the contrary, the maps depict new pipelines traversing through wetland plant communities, RCAs, and potentially jurisdictional wetlands (Figure 1 and 2).

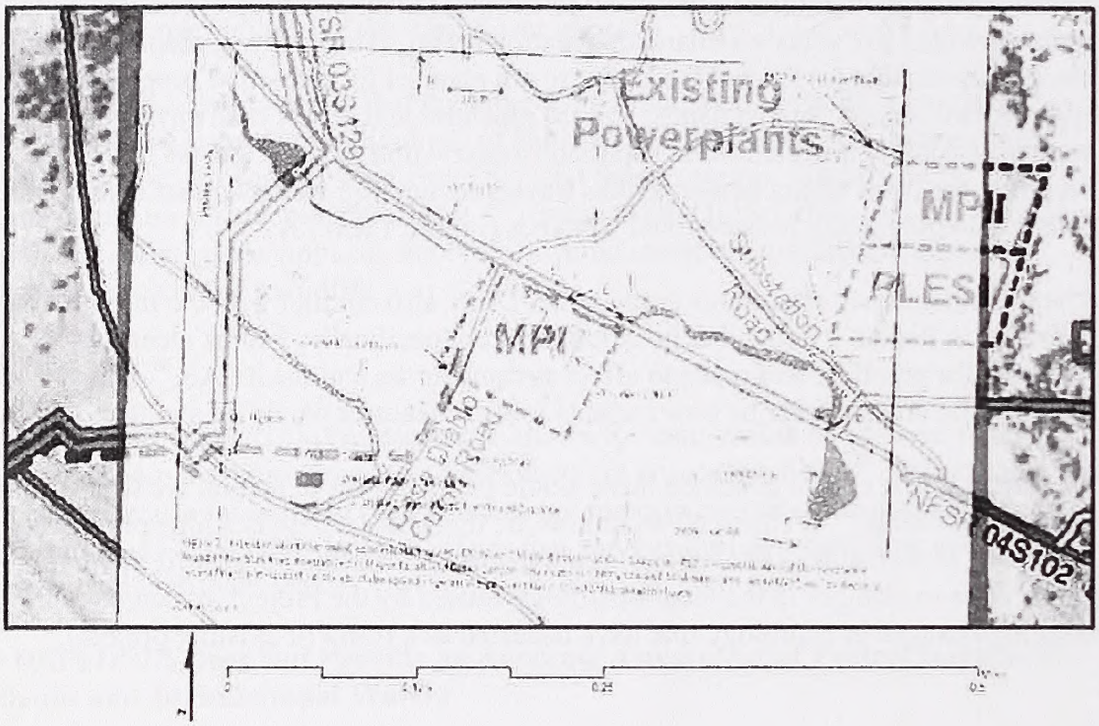
The aforementioned statements in the DEIS/DEIR also conflict with the information provided in Paulus's wetland delineation report. Specifically, Paulus identified the potential for pipelines and roads to affect streamcourses and the RCAS.[96] The DEIS/DEIR fails to describe how impacts to these features would be avoided.

The DEIS/DEIR cannot conclude there would be no impact to federal wetlands during decommissioning.[97] Wetland communities are dynamic. There is a high probability that the extent of wetlands in the Project area will change over the 30-year lifespan of the Project due to changes in the local hydrology caused by the Project, in conjunction with ongoing changes in hydrology that have occurred as a result of existing projects.

I9-108 cont.

[95] *Ibid.*
[96] See caption to Figure 1 in: Paulus J. 2012. Investigation of Riverine Resources Including Wetlands at the Proposed CD4 Project, Mammoth Lakes, California.
[97] DEIS/DEIR, p. 4.3-12.

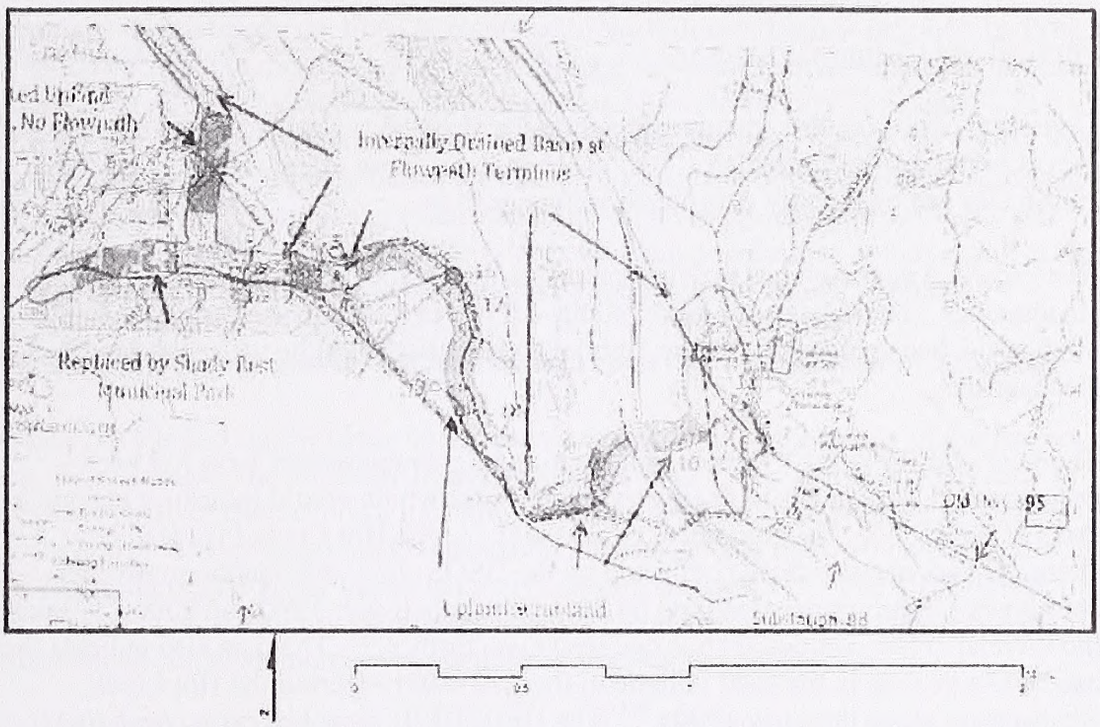
Wetlands Figure 3 over DEIS/DEIR Figure 2-8



I9-108 cont.

Figure 1. Project features near existing power plants in relation to wetlands mapped by Paulus. Project pipelines (turquoise lines) would pass through wetlands (dark blue polygons).

Wetlands Figure 4 over DEIS/DEIR Figure 2-8



I9-108 cont.

Figure 2. Project features in relation to RCAs (red corridor) and blue line streamcourses. Project pipelines (turquoise lines) would pass through RCAs and potentially jurisdictional features (non-shaded portions of corridor).

The DEIS/DEIR Does Not Adequately Assess Potentially Significant Impacts to the Owens Tui Chub

When the USFWS designated critical habitat for the Owens tui chub, it identified activities that may adversely affect that critical habitat. They include "activities that decrease available water or cause a significant change in the physical or chemical properties (e.g., temperature, pH, or dissolved gases) of the water."[98]

Experiments and observations conducted after critical habitat was designated suggest that aquatic vegetation is an important ecological component of critical habitat in the Hot Creek Headsprings.[99] Another outstanding component, and one that is highly interrelated, is the constancy of the environment, primarily flow and temperature.

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[98] U.S. Fish and Wildlife Service. 1985. Endangered status and critical habitat designation for the Owens tui chub. Final rule. Federal Register 50(150): 31592-31597.

[99] McEwan D. 1991. Microhabitat Selection of the Owns Tui Chub, Gila bicolor snyderi, in the Hot Creek Headsprings, Mono County, California. Proceedings of the Desert Fishes Council, Vol. XX and XXI. Desert Fishes Council, Bishop, California. pp. 11-24.

Environmental constancy, among other things, allows for the persistence of the vegetation through the winter, as well as a year-round production of the aquatic invertebrate fauna. Any management or recovery plan for the Owens tui chub in the Headsprings should recognize the importance of these two ecological components.

Physical and Chemical Properties

Owens tui chubs require aquatic vegetation for cover, foraging, and spawning, as well as gravel substrates for spawning.[100] If one or more of these elements are absent, the subspecies can be quickly extirpated from a location.

Historically, vegetation has provided abundant cover for tui chubs in the Hot Creek Headsprings. There has been a limited die-off of vegetation beds during the winter, but most of the beds persist due to the thermal characteristics of the water entering the Headsprings.

The DEIS/DEIR states "changes in hot spring inlet temperatures have not been accompanied by changes in chemistry of the water which would indicate a change in thermal inflow."[101] This statement is incorrect. At the Hot Creek Fish Hatchery, chemical-flux measurements collected by the USGS show that the thermal-water component in the springs declined by 30% to 40% between 1990 and 2000.[102] Since then the thermal-water component has declined even further.[103] The data also indicate there has been a decline in the total volume of thermal water entering the Hot Creek Headsprings since the early 1990s.[104] The DEIS/DEIR must be revised such that it accurately reports the data collected by the USGS. A revised DEIS/DEIR must also address how the reductions in thermal water have affected vegetative cover and prey resources (i.e., aquatic invertebrate fauna) for the Owens tui chub. It also must address how additional reductions in thermal water may affect these resources. Until the DEIS/DEIR establishes the physical and chemical properties that currently exist within the Hot Creek Headsprings, it will be impossible to evaluate the effects of the Project on tui chub habitat, and thus, the tui chub population.

I9-109

The Applicant's consultant has predicted the Project would reduce thermal outflow in the Hot Creek Headsprings by approximately 17 percent.[105] I concur with Dudek and ICF International that "[a]ny reduction in flow from springs in the Owens Basin would result

[100] See literature cited in: Dudek and ICF International. 2012. Desert Renewable Energy Conservation Plan. 2012 Mar 2 Draft. Species Account for the Owens Tui Chub (*Siphateles bicolor snyderi*).
[101] DEIS/DEIR, p. 4.4-13.
[102] Sorey ML. 2000. Geothermal Development and Changes in Surficial Features: Examples from the Western United States. Proceedings of the World Geothermal Congress 2000; Kyushu - Tohoku, Japan, May 28 - June 10, 2000. pp. 705-711.
[103] Howle JF, CD Farrar, K Bazar. 2012 Feb 13. Long Valley Hydrologic Advisory Committee Hydrologic Monitoring Data for the Period Ending December 2011.
[104] *Ibid.*
[105] DEIS/DEIR, p. 4.4-13.

in further reductions of habitat quality and quantity for the Owens tui chub at springs and tributaries of the Owens River."[106]

Indeed, there is circumstantial evidence that the Owens tui chub populations in the Headsprings have already declined in response to the reduced thermal inflows. In 1988, prior to the decrease in thermal water to the springs, the population estimate for Owens tui chub in the AB Spring was 334±105, and it was 523±146 in the CD Spring.[107] In 1999, after the decrease in thermal water, the population estimate for the AB Spring was 180 to 245 individuals (no confidence interval provided), and no tui chub were detected in the CD Spring.[108] Whereas the exact cause and effect relationship is unknown, one can infer that the apparent decline in the Owens tui chub populations could be due to the decline in the thermal water component given its influence on tui chub habitat.

I9-109 cont.

The DEIS/DEIR Lacks an Assessment of the Project's Contribution to Tree-Kills

Tree-kills have broad implications on sensitive resources and the ecology of the Project region. For example, the DEIS/DEIR acknowledges that "[n]on-native annuals such as cheat grass, redstem filaree, black mustard, Russian thistle (*Salsola tragus*), and silver hairgrass (*Aira caryophyllea*) attain weedpatch dominance and up to 90 percent cover where recent thermal activity has killed native shrubs and trees."[109] The DEIS/DEIR needs to assess the potentially significant impacts associated with additional tree-kills that may occur due to an increase in geothermal operations.

I9-110

The DEIS/DEIR Fails to Disclose, Analyze, or Provide Mitigation for Potentially Significant Noise Impacts to Wildlife Species

Drilling operations would take place 24 hours per day, 7 days per week, and each geothermal well would take approximately 60 days to complete.[110] Drilling operations and construction of the power plant are expected to produce average noise levels of up to 85 dBA at 50 feet.[111] Operation of the power plant is expected to produce average noise levels of 71.5 dBA at 150 feet, 64.5 dBA at 400 feet, 54 dBA at 0.25 mile (1,320 feet), and 48 dBA at 0.50 mile (2,640 feet) from the center of the plant.[112] Noise levels from the well pumps are expected to be 58 dBA at 100 feet from the well pump.[113] Because the DEIS/DEIS provides the average noise levels, the peak noise levels associated with the Project would presumably be higher.

I9-111

The noise levels reported in the DEIS/DEIR are high enough to significantly impact wildlife. For example, Reijnen et al. (1997) concluded sound levels above 50 dBA could

[106] Dudek and ICF International. 2012. Desert Renewable Energy Conservation Plan. 2012 Mar 2 Draft. Species Account for the Owens Tui Chub (Siphateles bicolor snyderi), p. 10.
[107] US Fish and Wildlife Service. 2009. Owens Tui Chub: 5-Year Review and Evaluation, Table 1.
[108] *Ibid.*
[109] DEIS/DEIR, p. 3.3-5.
[110] *Ibid*, p. 2-25.
[111] *Ibid*, pp. 4.11-3 and -5.
[112] *Ibid*, p. 4.11-7.
[113] *Ibid*. p. 4.11-8.

be considered potentially deleterious to breeding birds within an average of 1,000 m (3,280 feet) from the source of noise.[114]

Animals rely on hearing to avoid predators, obtain food, and communicate. Noise and vibration have the potential to disrupt these activities, and otherwise reduce fitness through injury (e.g., hearing loss), energy loss (from movement away from noise source), reduction in food intake, and habitat avoidance and abandonment.[115] The DEIS/DEIR fails to disclose, analyze, or provide mitigation for potentially significant impacts of Project noise on wildlife.

I9-111 cont.

The DEIS/DEIR Fails to Disclose, Analyze, or Provide Mitigation for the Potentially Significant Impacts Associated With Soil Stabilizers

Soil stabilizers (also known as soil binders, dust suppressants, or dust palliatives) may be used at the Project site.[116] The majority of soil stabilizers are made from waste products from the manufacturing industry and many contain chemicals that are toxic to plants and animals.[117] Because soil stabilizers are generally applied over the ground surface, any vegetation or fauna on the site, including soil microorganisms, may come into direct contact with the stabilizer. Application of soil stabilizers has been associated with the browning of trees along roadways and stunted vegetation growth in forestlands, and they have caused sickness and adverse effects on reproduction in terrestrial animals.[118] The DEIS/DEIR fails to disclose, analyze, or provide mitigation for potentially significant adverse impacts associated with use of soil stabilizers at the Project site.

I9-112

The DEIS/DEIR Fails to Address the Potentially Significant Impacts Associated with Ravens, Crows, and Other Predators that May Benefit from the Project

Common ravens and American crows are nest predators of sage-grouse and other shrub-nesting birds.[119] Common ravens, American crows, and other predators benefit from anthropogenic features. For example, common ravens use power lines for nesting and as hunting perches.[120]

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[114] Reijnen R, R Foppen, G Veenbaas. 1997. Disturbance by traffic of breeding birds: evaluation of the effect and planning and managing road corridors. Biodiversity and Conservation 6: 567-581.
[115] National Park Service, 1994. Report to Congress, Report on effects of aircraft overflights on the National Park System.
[116] DEIS/DEIR, p. 2-54.
[117] U.S. Environmental Protection Agency. 2004 Mar. Potential Environmental Impacts of Dust Suppressants: Avoiding another Times Beach. In: An Expert Panel Summary, May 30-31, 2002, Las Vegas, Nevada. Available at: http://www.epa.gov/nerlesd1/cmb/pdf/dust.pdf
[118] *Ibid.*
[119] Connelly, J. W., S. T. Knick, M. A. Schroeder, and S. J. Stiver 2004. Conservation Assessment of Greater Sage-grouse and Sagebrush Habitats. Western Association of Fish and Wildlife Agencies. Unpublished Report. Cheyenne, Wyoming. Available at: http://www.ndow.org/wild/conservation/sg/index.shtm.
[120] *Ibid.*

Common ravens and American crows often forage >10 km from nests or perches.[121] Consequently, anthropogenic features that benefit raven and crow populations can cause indirect impacts that extend a great distance. The DEIS/DEIR fails to discuss how Project features and activities may attract and subsidize unnaturally high numbers of ravens, crows, and other predators. Because the DEIS/DEIR does not provide any mitigation for this potentially significant impact, the Project may cause an unmitigated impact on sage-grouse, deer, and other prey species that occur in the Project region. I9-113

MITIGATION

Decommissioning

Sensitive plant and animal resources have the potential to colonize the Project site during the 30 years prior to decommissioning. Because the Project has the potential to impact sensitive biological resources during decommissioning, the Applicant should be required to conduct focused surveys for sensitive biological resources prior to any decommissioning activities. The Applicant should also be required to consult with the USFWS and the CDFW prior to, and during, decommissioning. I9-114

The DEIS/DEIR Improperly Defers the Preparation of Plans Fundamental to the Success of Project Mitigation

The DEIS/DEIR improperly defers formulation of the (a) Drainage and Runoff Management Plan; and (b) Weed Management Plan until after the environmental review process terminates.[122] The lack of these plans precludes the ability to evaluate their effectiveness in mitigating significant impacts of the Project.

According to the DEIS/DEIR, "the Drainage Plan shall evaluate potential changes in stormwater flow that would result from implementation of the Proposed Action."[123] Changes in stormwater flow have the potential to affect the wetlands in the vicinity of the existing power plant facilities. The DEIS/DEIR must disclose and analyze the potential for these changes to occur; it cannot defer the analysis to a forthcoming Drainage Plan. It also must identify the erosion control measures that will be installed on Project roads, and the design of stream crossings, such that the Project complies with Mammoth Lake General Plan Policy R.2.D that prohibits placing intermittent streams in culverts.[124] I9-115

Several noxious weed species are present in the Project area where topsoil has been scraped away for recent well pad or road construction.[125] This demonstrates that the Applicant has been unsuccessful in preventing the spread and colonization of noxious

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[121] Connelly, J. W., S. T. Knick, M. A. Schroeder, and S. J. Stiver. 2004. Conservation Assessment of Greater Sage-grouse and Sagebrush Habitats. Western Association of Fish and Wildlife Agencies. Unpublished Report. Cheyenne, Wyoming. Available at: http://www.ndow.org/wild/conservation/sg/index.shtm.

[122] DEIS/DEIR, pp. 4.3-3 and -20.

[123] *Ibid*, p. 4.19-22.

[124] *Ibid.* p. 3.3-25.

[125] *Ibid*, p. 3.3-5.

weeds, and it exemplifies the need for a detailed Weed Management Plan that can be vetted by the public, resource agencies, and biologists prior to a decision on the Project. I9-115 cont.

Vegetation

Mitigation Measure VEG-1 includes measures to minimize impacts to vegetation resources. The mitigation measure, which includes implementation of erosion control practices and a Revegetation Plan, is not adequate because it fails to identify (a) the monitoring methods and schedule; (b) the adaptive management or remedial action plan if success criteria are not met; and (c) an enforcement mechanism. I9-116

Invasive Plants

I have the following comments pertaining to Mitigation Measure VEG-2 (Weed Management Plan):

1. The DEIS/DEIR indicates "[b]aseline weed conditions shall be assessed during the pre-construction phase of the CD-IV Project, during pre-construction surveys and staking and flagging of construction areas."[126] The pre-construction phase may not be the appropriate time of year to determine the presence, abundance, and distribution of weeds. The timing for baseline weed surveys should be dictated by the phenology of potentially occurring weed species and not by the timing of the Project.
2. The DEIS/DEIR indicates, "[a] stratified random sampling technique shall be used to identify and count the extent of weeds on the site."[127] This technique cannot be evaluated because the DEIS/DEIR does not identify the sampling intensity and area. I9-117
3. According to the DEIS/DEIR "[m]onitoring shall take place each year during construction, and annually for the lifespan of the Project following the completion of construction."[128] The DEIS/DEIR needs to identify the monitoring methods.
4. Decommissioning activities will result in conditions that promote the colonization and/or spread of weeds. As a result, weed monitoring and control activities need to extend at least three years past the end of decommissioning.
5. The DEIS/DEIR indicates, "[c]ontrol methods shall be implemented when measurable weed increases, as well as visually verified increases, are detected during monitoring."[129] This condition is too vague. The DEIS/DEIR needs to identify the metric that will be used to identify "measurable weed increases" (e.g., relative abundance, density, or distribution).

[126] *Ibid*, p. 4.3-20.
[127] *Ibid.*
[128] *Ibid.*
[129] *Ibid*, p. 4.3-21.

6. Mitigation Measure VEG-2 establishes a remedial action trigger for all non-native weed species already present in the Project area, except cheatgrass. As the DEIS/DEIR acknowledges, cheatgrass may pose the biggest threat to vegetation resources in the Project area.[130] As a result, the Project's contribution to an increase in cheatgrass appears to be unmitigated. The DEIS/DEIR needs to clarify and justify (a) the areas where cheatgrass will be controlled; (b) the areas where cheatgrass will be eradicated; and (c) the areas where cheatgrass will be left untreated.

7. The Project has the potential to promote the colonization and spread of weeds throughout its lifespan and until the site has been successfully restored following decommissioning. However, the DEIS/DEIR indicates the success of the Weed Management Plan will be determined after the first three years of monitoring and reporting.[131] This eliminates an enforcement mechanism that ensures weeds are controlled for the remaining 27 years of the Project. The proposed success criteria and reporting measures should be required for the life of the Project, and for at least three years following decommissioning.

I9-117 cont.

Sump Pits

Mitigation Measure WIL-2 for the Project is:

> [w]ater which may accumulate in geothermal well site basins from precipitation shall be removed to a standing depth of 2 inches from the respective basins on a daily basis or as soon as operationally feasible; and liquids deposited into the basins shall either be removed daily to a standing depth of 2 inches, or the basins shall be made wildlife escapable by creating earthen ramps at slopes of 1:3 or less at intervals of 100 feet apart or less around the perimeter of the standing depth of the liquid stored in the basin. The basins shall be monitored during well drilling to determine if these measures are effective. If monitoring determines that these measures are ineffective in preventing wildlife from drowning in the basins, an alternative deterrent or escape structure such as netting will be implemented. Alternatives for providing equally effective measures which would allow wildlife to escape unharmed from the well site basins may be authorized subject to USFS, USFS, and CDFG approval.[132]

I9-118

The DEIS/DEIR concludes this mitigation measure will prevent wildlife from becoming trapped in the lined well site basins, and that it will help reduce impacts to special-status wildlife to a less-than-significant level.[133] I disagree with these conclusions for several reasons.

First, removal of water and other fluids from the basins is conditioned on feasibility, which the DEIS/DEIR fails to define or discuss. Consequently, implementation of the mitigation measure is uncertain, and its effectiveness is unreliable.

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[130] *Ibid*, p. 4.3-16.
[131] *Ibid*, p. 4.3-21.
[132] *Ibid*, p. 4.4-30.
[133] *Ibid*, pp. 4.4-10 and –19.

Second, organisms that fall into the basin can suffer ill effects as soon as they come into contact with fluids in the basin. Even if the organisms are able to locate and swim to the escape ramps, the escape ramps do not mitigate the adverse effects to a less-than-significant level. Presumably the purpose of lining the basins is to prevent hazardous fluids from contaminating the soil and groundwater. It is unclear how the Applicant would be able to install earthen ramps that enable wildlife to escape, yet do not expose soil and groundwater resources to hazardous fluids.

I9-118 cont.

Third, the DEIS/DEIR provides no evidence that the proposed mitigation measures would be effective. Indeed, the DEIS/DEIR suggests it may not be. This issue is confounded because the DEIS/DEIR fails to define the monitoring methods, schedule, and duration. In addition, it fails to establish success criteria, triggers for remedial actions, a reporting program, or a mechanism for enforcement.

Several states require netting or screening of sump pits containing oil to prevent access by wildlife. This measure is feasible, and it should be required for the Project.

Wildlife

The Project may have a significant impact on wildlife movement.[134] The DEIS/DEIR concludes the implementation of Mitigation Measure PDM BIO-1 would reduce the impact to a less-than-significant level. PDM BIO-1 requires a qualified wildlife biologist to walk the pipeline route once each year for the first three years following completion of construction to survey for any signs that the pipeline is impeding wildlife movement. The DEIS/DEIR fails to justify how the proposed measure might be effective. It is unforeseeable that a biologist "walking" the pipeline route a total of three times, to accomplish a mitigation measure without any performance standards or triggers, would be able to determine if the pipeline is impeding wildlife movement. The mitigation measure needs to be redesigned to incorporate remote cameras or other specialized techniques that would provide data on wildlife movement in the vicinity of the Project pipelines. In addition, deer in both the Round Valley and Casa Diablo herds have been fitted with radio-telemetry collars. Data from the radio-telemetry collars should be incorporated into the analysis of potential impacts to wildlife movement.

I9-119

The PDMs and Mitigation Measures proposed in the DEIS/DEIR have been formulated to avoid or minimize impacts to special-status wildlife. However, they do nothing to compensate for impacts to individuals and their habitat, which the DEIS/DEIR identifies as a significant impact.

I9-120

For right-of-way applications that are longer than one mile or that would disturb more than two surface acres, it is the BLM's policy to require measures that minimize impacts to sage-grouse habitat.[135] In addition to this kind of onsite mitigation, the BLM has

I9-121

[134] *Ibid*, p. 4.4-20.

[135] US Department of the Interior, Bureau of Land Management. 2012 Nov 16. Wildlife: Greater sage-grouse conservation [internet]. Available at: http://www.blm.gov/id/st/en/prog/wildlife-botany-

indicated it will develop and consider offsite mitigation measures in cooperation with the applicant, USFWS, BLM State Director, and the Director of the CDFW.[136] The DEIS/DEIR provides no evidence that this coordination has occurred, or will occur. In my professional opinion, habitat compensation is required to mitigate Project impacts to the greater sage-grouse, northern goshawk, American marten, and other special-status wildlife species.

I9-121 cont.

Nesting Birds

Mitigation Measure WIL-1 requires pre-construction surveys for bird nests within 250 feet of areas potentially affected by construction activities.[137] The results of the surveys then would be emailed to CDFW, USFS, and USFWS at least three days prior to construction.[138] If any nests are detected, the Applicant would be required to establish a no-work buffer zone around the nest.[139] The size of the no-work buffer zone would be determined in consultation with the CDFW, USFS, and USFWS, although a 500-foot buffer would be used when possible.[140]

Research indicates nest finding is labor intensive and can be extremely difficult due to the tendency of many species to construct well-concealed or camouflaged nests.[141] In general, bird nests are located when a variety of search techniques are used and considerable time is devoted to the effort.[142] As a result, the DEIS/DEIR needs to establish the minimum standards for locating nests and minimizing human-induced disturbance. It also needs to establish that pre-construction surveys for the northern goshawk should adhere to the survey guidelines issued by the USFS.[143]

I9-122

The DEIS/DEIR establishes 500 feet as the minimum buffer size around active bird nests. However, it only requires nesting bird surveys within 250 feet of areas potentially affected by construction activities. The Applicant would be unable to establish a 500-foot buffer around all nests if the survey efforts extend only 250 feet beyond the construction area.

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forestry_pgm/wildlife-pgm/BLM-sensitive-species_Idaho/greater-sagegrouse_pgm/conservation_2011/ROWs.html.

[136] US Department of the Interior, Bureau of Land Management. 2012 Nov 16. Wildlife: Greater sage-grouse conservation [internet]. Available at: http://www.blm.gov/id/st/en/prog/wildlife-botany-forestry_pgm/wildlife-pgm/BLM-sensitive-species_Idaho/greater-sagegrouse_pgm/conservation_2011/ROWs.html.

[137] DEIS/DEIR, pp. 4.4-29 and -30.

[138] *Ibid.*

[139] *Ibid.*

[140] *Ibid.*

[141] DeSante DF, GR Geupel. 1987. Landbird productivity in central coastal California: the relationship to annual rainfall and a reproductive failure in 1986. Condor. 89:636-653. See also Baicich PJ, CJ Harrison. 1997. A guide to the nests, eggs, and nestlings of North American Birds. 2nd ed. London: Academic Press.

[142] Martin TE, C Paine, CJ Conway, WM Hochacka . 1996. BBIRD field protocol. Montana Cooperative Wildlife Research Unit, Missoula (MT).

[143] See Woodbridge, B.; Hargis, C.D. 2006. Northern goshawk inventory and monitoring technical guide. Gen. Tech. Rep. WO-71. Washington, DC: U.S. Department of Agriculture, Forest Service. 80 p.

Some species of birds can build a nest and initiate egg-laying in less than 14 days. The mitigation measure should be revised to require pre-construction surveys no more than seven days prior to construction.

The DEIS/DEIR fails to justify why the resource agencies would not be notified of the survey results until as few as 3 days prior to construction, especially because it is feasible to notify them shortly after the surveys are completed (i.e., within 24 to 48 hours). The buffer size needed to protect a bird nest from disturbance is highly dependent on site-specific conditions. Emailing the survey results to the CDFW, USFS, and USFWS three days prior to construction may not be enough time for the agencies to coordinate a site visit with the Applicant's biologist to determine the appropriate buffer size(s).

I9-122 cont.

Offsite Aquatic Habitat

According to the DEIS/DEIR, existing monitoring programs under the oversight of the Long Valley Hydrologic Advisory Committee would be expanded to include monitoring for the Proposed Action, in accordance with PDM GEO-5, which is:

> ORNI 50, LLC commits to continuing to operate the existing geothermal projects in conformance with the Plans of Operation for Development, Injection and Utilization, approved by the BLM and USFS, as well as in conformance with monitoring through the Long Valley Hydrologic Advisory Committee, and remedial action programs, which are designed to prevent, or mitigate, potential hydrothermal impacts to the Owens tui chub critical habitat, Hot Creek Hatchery and Hot Creek Gorge springs from geothermal operations conducted on federal geothermal leases in the Mono-Long Valley area. ORNI 50, LLC also commits to operating the proposed geothermal project in conformance with these requirements.

I9-123

The DEIS/DEIR concludes this mitigation measure will ensure impacts to the Owens tui chub and its critical habitat would be less than significant.[144] There are several flaws with the DEIS/DEIR's conclusion.

First, the DEIS/DEIR fails to provide adequate information pertaining to the existing monitoring program. I obtained the hydrologic monitoring data that the USGS has collected for the Long Valley Hydrologic Advisory Committee. These data are limited to graphs depicting the relationship between a dependent variable (e.g., water temperature) and an independent variable (e.g., year). There does not appear to have been any statistical analysis of the data or any analytical interpretation of the results. The monitoring program has little value unless the data are analyzed and interpreted.

Second, the value of the proposed mitigation measure cannot be evaluated until the BLM and GBUAPCD identify:

1. the variables that will be monitored. Research indicates variables other than temperature may affect tui chub habitat. As a result, the original hydrologic monitoring program (i.e., for PLES I) may no longer be sufficient.

[144] DEIS/DEIR, p. 4.4-19.

2. the party(ies) responsible for analyzing and interpreting the data.
3. the statistical techniques that are (and will be) used to analyze the data, and the corresponding confidence levels that are (and will be) used in the statistical tests.
4. the specific details of the remedial action program, including the specific monitoring results that would trigger remedial actions.
5. an enforcement mechanism that ensures remedial actions are implemented and successful.
6. how the existing monitoring programs "would be expanded to include monitoring for the Proposed Action."
7. how the Long Valley Hydrologic Advisory Committee will be able to distinguish whether changes in the response variables are due to the CD-IV Project; other geothermal projects in Casa Diablo; naturally occurring events; or an interaction among these factors. As the DEIS/DEIR acknowledges, "it is difficult to identify the smaller effects of geothermal development on the Hatchery springs relative to natural climatic effects because climatic variations and geothermal reservoir changes have both occurred simultaneously."[145]

I9-123 cont.

Third, past experience demonstrates the monitoring program has been ineffective. Specifically, the monitoring program has been ineffective in reversing the decline of thermal water to the Hot Creek Headsprings that began in 1993, or in preventing the significant decline in the Owens tui chub populations that corresponded with the decline in thermal water.

Lastly, the hydrologic and biologic monitoring and mitigation program proposed for the Project may be inconsistent with USFWS Recovery Plan for the Owen tui chub. In particular, Recovery Task 2.4.2 is:

> Protect spring discharge. Geothermal development and groundwater pumping in Long Valley may alter aquifer dynamics. Springs supporting Hot Creek should be protected from adverse impacts of decreased discharge, and changes in the thermal and chemical characteristics of water. Monitoring programs should be [designed to] determine characteristics (temporal, chemical, physical) of natural spring discharge, if spring discharge is being affected, and the location of activities causing adverse effects. Actions should be taken to protect discharge at 1998 levels.[146]

Based on my review, the hydrological and biological monitoring program has not ensured consistency with the Recovery Task (i.e., it has not prevented potential adverse impacts associated with changes in the thermal and chemical characteristics of water in AB Spring and CD Spring), or that actions are, have been, or will be taken to protect discharge at 1998 levels.

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[145] *Ibid*, p. 4.4-13.

[146] U.S. Fish and Wildlife Service. 1998. Owens Basin Wetland and Aquatic Species Recovery Plan, Inyo and Mono Counties, California. Portland, Oregon. [emphasis added].

Recommended Mitigation

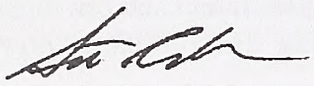
The loss of the Owens tui chub populations in Hot Creek Headsprings would be an extremely significant impact that would jeopardize the continued existence of the subspecies. As a result, mitigation imposed by the BLM and GBUAPCD should be expanded to include: (a) a management plan for the Owens tui chub populations in the Hot Creek Headsprings; and (b) a reintroduction plan that will be implemented if the populations in the headsprings drop below the minimum viable population level. I9-124

Tree-Kills

The DEIS/DEIR lacks any mitigation for the Project's contribution to tree-kills. Non-native plants colonize sites where recent thermal activity has killed native shrubs and trees.[147] As a result, the Applicant should be required to control and eradicate weeds in the tree-kill areas.

To be consistent with Mono County's General Plan, the Applicant needs to prepare a written analysis of the impacts that the Project and other development projects may individually or cumulatively have on tree-kills.[148] The Applicant should then develop a monitoring plan subject to review by the BLM, GBUAPCD, USFS, County, CDFW, USGS, and other relevant resource agencies. Specific triggers for additional mitigation should be established in conjunction with the monitoring plan. Once Project operations commence, the tree-kills should be monitored to determine the extent of additional impacts to vegetation and other biological resources. If the monitoring indicates geothermal operations have contributed to additional tree kills, the Applicant should take the actions necessary to reduce any adverse effects to less-than-significant levels. I9-125

Sincerely,



Scott Cashen, M.S.
Senior Biologist

[147] DEIS/DEIR, p. 3.3-5.
[148] County of Mono Community Development Department. 2010. Mono County General Plan. Bridgeport, CA. (Drafted July 1997 and Revised 2010). Conservation /Open Space Element-2010, Goal 1.

Comments

Of the
California Unions for Reliable Energy

On
Joint Draft Environmental Impact Statement / Environmental Impact Report for ORNI 50 LLC's Casa Diablo IV Geothermal Development Project

Mono County

Prepared and Submitted
to the
U.S. Bureau of Land Management and the
Great Basin Unified Air Pollution Control District

ATTACHMENT B

January 29, 2013

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2632-021cv

EXHIBIT B

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January 25, 2013

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Subject: **Comments on the Draft Environmental Impact Report for the Casa Diablo IV Geothermal Development Project, Mono County, California**

Dear Mr. Reinhardt and Ms. Sudoimer:

We have reviewed the November 2012 Draft Environmental Impact Statement and Draft Environmental Impact Report (herein referred to as "DEIS/R") for the Casa Diablo IV geothermal project ("CD-IV Project") in the vicinity of Mammoth Lakes in Mono County, California. The Project would include the following:

- A new 33-megawatt (MW) geothermal power plant will be comprised of two binary generating units, turbines, condensers, pumps, piping, ancillary equipment, and an underground electric transmission line to interconnect to the Southern California Edison substation;
- Up to 16 geothermal wells will be drilled ranging from depths of 1,500 to 2,500 feet with each well on a 0.4-acre well pad and include a small pump building; and
- Pipelines to bring the geothermal brine to the power plant and take cooled brine to the injection wells.

Our review has focused potential impacts to geothermal resources in the Casa Diablo area and issues associated with stormwater. We have found the DEIS/R fails to adequately identify impacts to high-value natural resources, including a fish hatchery and hot springs, which offer unique recreational

I9-126

activities and ecological habitat. Mitigation measures proposed in the DEIS/R will not reduce Project impacts to a less than significant level as stated in the DEIS/R. A revised DEIS/R should be prepared to fully disclose all impacts and provide adequate mitigation to ensure impacts to natural resources are minimized.

I9-126 cont.

Project will greatly expand use of geothermal resources

Currently, 40 MW of power is being produced at the MP I project located on 90 acres in the Casa Diablo area. MP I commenced operation in 1984 with a capacity of producing 10 MW. Two additional units, PLES I and MP II, each producing 15 MW, began operation in 1990. Mono County recently approved an application to replace the existing MP I power plant with a newer facility (M1 Replacement Project) capable of producing 18.8 MW.

The proposed Project would generate an additional 33 MW of power on 80 additional acres of land and increase power production in the Casa Diablo area by 83%. Project construction will greatly increase the use of geothermal resources in the area. The Mammoth Hot Creek is within the Hot Creek Geological Area, under U.S. Forest Service Administration,[1] and contains over a dozen steam vents and bubbling blue pools, some of which occasionally erupt to form geysers.[2]

The Mammoth Hot Creek is a unique geothermal resource with a finite amount of energy stored in its springs. The Project will increase the existing extraction of geothermal fluid from the reservoir by 50% and expand production by 6,000 gallons per minute (DEIS/R, p. 4.7-3). The reservoir is connected to Hot Creek Springs and other geothermal resources. Hot Creek Springs is an irreplaceable and high-value resource and any related development and increased heat extraction may pose a significant impact on geothermal resources.

Appendix D to the DEIS/R describes the following concerns associated with development of geothermal resources on recreational features and ecologic habitat:

- Hot Creek Springs was identified as a concern because of its high value recreational significance and variations in spring flow;
- Hot Bubbling Pool is potentially sensitive because it is one of the thermal springs closest to Casa Diablo and monitoring records show that water levels in the pool are particularly sensitive to aquifer pressure changes;
- Hot Creek Fish Hatchery was identified as sensitive "because of the small (2-5%) contribution of thermal water that improves spawning conditions at the Hatchery." The thermal water contribution raises water temperatures an average of 5°C (41°F) above background, which supports fish spawning (Appendix D, pp. D-34 – D-35).

The DEIS/R states that the Project will be designed in a way to prevent or mitigate any potential hydrothermal impacts to the hot springs and fish hatchery from geothermal operations (DEIS/R, p. 4.8-

I9-127

[1] http://www.fs.usda.gov/recarea/inyo/recarea/?recid=20414
[2] http://pubs.usgs.gov/fs/2007/3045/fs2007-3045.pdf

2). However, the DEIS/R conclusion that Project construction and operation will result in less than significant impacts fails to account for the modeling estimates from the Applicant's own consultants that indicate potentially significant declines in thermal discharge, temperature, and reservoir pressure. These impacts must be fully disclosed and adequately addressed and mitigated in a revised DEIS/R. The impacts, identified in Appendix D, have the potential to degrade geothermal features that provide critical ecological habitat to the Owens tui chub fish population and recreational value to the public.

I9-127

Impacts on thermal discharge are uncertain and require independent review and monitoring in order to verify their reliability

The production of 33MW from the Project will increase power production in the Casa Diablo area by 83% and increase geothermal fluid extraction by 50% over current production at the site (from the existing facilities). This increase in the energy production and fluid extraction will cause declines in the temperature of the water that is heated by hot rock at depth (thermal water) and a decline in reservoir pressure. On the basis of modeling conducted by the Applicant's consultants, the Project is estimated to cut thermal outflow to Hatchery Springs by about 17% (DEIS/R, p. 4.7-7) and reservoir pressure by up to 10.2 pounds per square inch (DEIS/R, p. 4.7-5). Both these estimates are highly interpretive and have only been evaluated by the Project proponent. An independent review is required to verify the results.

The DEIS/R states:

> Although the CD-IV Project is forecast to reduce the thermal outflow to Hatchery Springs by *about* 17 percent, the thermal water fraction is a very small part (less than 5 percent) of the total flow, so the impact to the combined cold and thermal discharge at the springs is forecast to be reduced by 0.85 percent and is not likely to be measureable relative to climatic effects. In addition, conductive buffering of the temperature would minimize potential temperature changes making such changes difficult to detect (DEIS/R, p. 4.7-7).

I9-128

There are several unsubstantiated estimates made in this statement that require independent evaluation.

1. "CD-IV Project is forecast to reduce the thermal outflow to Hatchery Springs by about 17 percent"

   The DEIS/R, in making this claim, relies upon Appendix D which, in turn, relies upon numerical computer models developed by the Project consultant. Modeling results, summarized in one paragraph of Appendix D which, paint a significantly less definitive prediction, which is exemplified in this concluding statement:

   > The potential impact at the Fish Hatchery Springs *could* be ~ 17% decline in thermal water input. The thermal water fraction of the Hatchery springs is a very small part of the total flow and spring temperatures have previously been shown to be *primarily*

dependent on seasonal fluctuations in precipitation and not the thermal component of flow (Sorey and Sullivan, 2006) (Appendix D, p. D-46).

The vague statement that there "could be a ~ 17% decline" shows the imprecision in the estimate of thermal discharge. The approximate 17% decline is not presented with a confidence interval to show the uncertainty in the estimate (i.e. +/- 5%). Without quantifying this uncertainty, there is no way to measure with any accuracy what the decline in thermal water output will actually be.

The DEIS/R mischaracterizes this rough estimate by stating that the "CD-IV Project is forecast to reduce the thermal outflow to Hatchery Springs by about 17 percent" (p. 4.7-7). This is a very important distinction that is not just semantic: "could be a ~17% decline" is a statement without any real limits whereas the DEIS/R makes a much more affirmative – and misleading – statement that the reduction is forecast to be "about 17%," upon which it bases its finding that there would be no significant impact.

I9-128 cont.

The optimal temperature range for the Owens tui chub is 15-20 degrees Celsius[3] with 13-17 degrees Celsius being the optimal range for spawning.[4] Spawning of the Owens tui chub is triggered by warming water temperatures.[5] The DEIS/R fails to provide the existing water temperature conditions currently reaching Hatchery Springs. The omission of this information is critical. Without this baseline information, it is impossible to gauge if a 17% (or any other percentage) decline in the temperature of the water reaching the fish hatchery would reduce temperature below the optimal range for the Owens tui chub. Therefore, the conclusion that the impacts from reduction in thermal outflow to the fish hatchery, as a result of the Project, are not significant is unsupported. The Project's potential to result in reduced spawning and negative impacts to the ecological habitat of the Owens tui chub remains unaddressed.

A revised DEIS/R should be prepared to include an accurate estimate of the percent reduction in temperature in thermal water input from the Project, to include the methodology and model inputs used to calculate the estimate. The current temperature of water reaching the fish hatchery and the estimated reduction in temperature from the Project should be quantified and disclosed. The DEIS/R should include a discussion on whether this reduction will adversely impact the ecological habitat and spawning conditions for the Owens tui chub.

2. "thermal water fraction is a very small part (less than 5 percent) of the total flow and thermal discharge at the springs is forecast to be reduced by 0.85 percent"

I9-129

This claim relies on an unsubstantiated estimate of the thermal water fraction of the total discharge to make a conclusion that thermal discharge at the springs will be reduced by less than 1%. The conclusion that thermal water is less 5% of the total discharge is not supported by

[3] http://calfish.ucdavis.edu/species/?uid=104&ds=241

[4] http://hegel.lewiscenter.org/users/mhuffine/subprojects/Student%20Led%20Research/chubworld/pdfs/tuichubgeologica03.pdf, p. 8

[5] http://www.drecp.org/meetings/linkdocs/2012-02-24_meeting/species_profiles/Owens_Tui_Chub.pdf, p. 6

any analysis in Appendix D and the there is no reference to any other report that makes this conclusion.

A revised DEIS/R needs to be prepared to provide scientific evidence (i.e. peer-reviewed articles or surveys undertaken by the U.S. Geological Survey) that support the claim that thermal water fraction is less than 5% of total flows. If this estimate is not supported, the Applicant should revise the thermal discharge reduction to the springs and discuss the subsequent impacts to the hot springs and fish hatchery.

I9-129 cont.

3. "conductive buffering of the temperature would minimize potential temperature changes making such changes difficult to detect"

The DEIS/R makes this claim without defining what conductive buffering is or how it would occur in the Project area. Appendix D also does not include a discussion on conductive buffering. The Applicant must show that conductive buffering can occur in the Project area in a method that would minimize temperature changes, as the DEIS/R claims. If conductive buffering can minimize potential temperature changes, effects should be quantified. The impact of buffering on temperature in waters reaching the springs and hatchery should be discussed.

I9-130

The DEIS/R's finding that thermal water temperature and pressure declines are insignificant is the lynchpin to its conclusion that Project construction and operation will not have an adverse impact on hydrothermal resources in the Casa Diablo area. The DEIS/R concludes, "Based on this assessment there would be limited potential for adverse impacts on the Owens tui chub or its critical habitat as a result of operation of the Proposed Action" (DEIS/R, p. 4.4-14).

I9-131

However, as our comments have explained, this assessment is baseless or, at best, fraught with uncertainty. The DEIS/R does not provide any reliable quantified information that would provide assurance that temperature declines will be insignificant and will not harm the invaluable downgradient resources. The DEIS/R needs to be revised to include an independent review, preferably by the U.S. Geological Survey, of the modeling estimates for reservoir temperature and pressure declines. Requests for independent reviews of the technological analysis and modeling provided in Appendix D has been made by other agencies, including the Sierra Club and the Mammoth Community Water District (Appendix A, pp. A-125, A-162). The focus of the review should be to assess the validity of the findings in Appendix D as well as the identification of a credible "worst-case" scenario for thermal water and pressure declines. The worst-case scenario should then be incorporated into a revised DEIS/R to predict hydrothermal impacts to the Owens tui chub critical habitat, Hot Creek Hatchery and Hot Creek Springs.

I9-132

In addition, enhanced monitoring provisions should be incorporated into a revised DEIS/R. Defined management actions tied to observations of critical temperature or pressure changes and reductions should be identified. Enhanced monitoring is especially important because temperature and pressure changes are difficult to detect. Even if detected, impacts to recreational features and habitat cannot be simply reversed; instead, a period of recovery would be necessary. Construction of 16 additional wells will increase heat extraction in the Casa Diablo area by 50%. A finite amount of energy, in the form of heat, is stored in the hot springs. If extraction occurs too rapidly, without consideration for temperature

I9-133

or pressure changes, the hot springs would need time to recover and calibrate to equilibrium pressure and temperature. Without adequate and vigilant monitoring, pressure and temperature changes may go unnoticed and mitigation necessary to reverse any impacts may not be implemented in a timely manner. If heat extraction resulting in temperature and pressure declines is continued without mitigation or allowing for a period of recovery, there may be permanent and irreversible damages to geothermal resources.

I9-133 cont.

The need for prescriptive monitoring is critical given that the U.S. Fish and Wildlife Service has identified habitat destruction as a major threat to the Owens tui chub and that reductions in flows from springs can result in habitat destruction.[6] Monitoring is necessary to ensure that the Project does not result in habitat destruction of the Owens tui chub.

To ensure protection of resources upon detection of a trigger event, such as a drop in temperature or pressure by some defined amount, management actions should be included in a memorandum of understanding (MOU) to be signed by the applicant and the County. For example, if triggers for temperature are exceeded then a reduction in power would result until temperature declines are reversed. A MOU was prepared for a groundwater extraction project in Cadiz Valley and the County of San Bernardino.[7] The MOU defined the terms of the activity (water drawdown), agreed-upon limitations (drawdown is limited to 80 feet at the wellfield), and measures to implement if limitations are breached (reduce pumping to maintain elevation about 80 feet). A similarly structured MOU should be drafted and included in a revised DEIS/R to show the Applicant's commitment to protection of the Project area's geothermal resources.

I9-134

Specific mitigation measures, such as reservoir pressure monitoring methodologies and locations, that would enhance monitoring are not included in the DEIS/R. Instead, the DEIS/R states that existing monitoring programs would be expanded to include monitoring for the Project. Mitigation Measure GEO-5 states that the monitoring programs would be in accordance with the Mono County General Plan (DEIS/R/S, p. 4.7-1). However, there is no explanation or details provided that explain how monitoring will be expanded and conform to the County General Plan. Furthermore, the Mitigation Measure GEO-5 makes no reference to any specific hydrologic monitoring. Mitigation Measure GEO-4 does state that the Project will be operated in conformance with monitoring through the Long Valley Hydrologic Advisory Committee and with remedial action programs designed "to prevent, or mitigate, potential hydrothermal impacts to the Owens tui chub critical habitat, Hot Creek Hatchery and Hot Creek Gorge springs from geothermal operations" (DEIS/R, p. 4.8-2). But again, no specifics are provided in the DEIS/R that would identify monitoring measures or demonstrate their effectiveness, i.e. how the Project will conform to monitoring and remedial programs to prevent impacts to the hydrothermal resources and dependent habitat.

I9-135

A revised DEIS/R needs to be prepared to include adequate monitoring measures (such as performance criteria and triggering benchmarks) that will ensure negative impacts to geothermal resources from Project construction and operation can be detected in a timely manner. In order for the mitigation to be

[6] http://www.drecp.org/meetings/linkdocs/2012-02-24_meeting/species_profiles/Owens_Tui_Chub.pdf, p. 8
[7] *See* Attachment A.

effective in ensuring the health and existence of the fish hatchery and ecological habitat of the Owens tui chub, monitoring needs to be tied to a MOU that will identify management actions that will be implemented if monitoring data shows critical changes thermal water temperatures and pressures.

I9-135 cont.

Potential Impact from construction and operation of injection wells

Up to 16 wells are to be constructed for the Project and half of these wells will be constructed as injection wells. The wells will reach depths of nearly a half mile (DEIS/R, p. 4.7-9). The DEIS/R fails to discuss the potential for the construction and operation of the wells to impact downgradient geothermal resources and ecological habitat.

Chemicals used during well drilling, construction, development, and production, including those used to enhance production or injection of geothermal fluids (i.e. fracking chemicals), are not disclosed in the DEIS/R. The DEIS/R only states, in Mitigation Measure HAZ-1, that the Project will comply with all local, state, and federal regulations regarding the use, transport, storage, and disposal of hazardous materials and wastes and that a Hazardous Materials Business Plan will be updated.

I9-136

However, the DEIS/R does not address the potential for these chemicals to flow into the subsurface toward geothermal features, including Hot Creek Gorge springs and Hot Creek Hatchery. The potential interconnection has been demonstrated in monitoring that was conducted in association with operation of the MP-II and the PLES-I within the Mammoth Pacific geothermal complex.[8] The motive fluid currently used at the Mammoth Pacific geothermal complex, isobutane, has been detected by the U.S. Geological Survey in downgradient surface water, in fumaroles at Casa Diablo and in the Hot Bubbling Pool, 3 miles to the east of the project area.[9] These geothermal plants use a closed-loop system which is intended to isolate the isobutane from the injection wells; however, the presence of the isobutane has led the U.S. Geological Survey to conclude that inadvertent leaks to the injection system occur and that a hydrologic interconnection exists between the injection wells and downgradient surface water.[10]

The detections of isobutane at downgradient springs, coupled with the documentation of releases to isobutane into the aquifer, demonstrate a connection between the injection wells and surface water. The U.S. Geological Survey concluded that less than 10% of the fluid injected at Casa Diablo moves into the production zone and that most flows away from the well field within the injection reservoir.[11] This conclusion means that injection fluid, including spent brine and any chemical additives, can move downgradient with the flow of groundwater to degrade groundwater resources and interconnected surface water bodies, including springs.

I9-137

Appendix D indirectly acknowledges this interconnection by stating that isobutane leaks have travelled to the Long Valley geothermal system (Appendix D, p. D-33). There is a clear connection and pathway between injection wells and surface water for chemicals used in well drilling, construction, and

[8] Letter from Mammoth Pacific, LLP to Great Basin Unified Air Pollution Control District, July 21, 1998 and April 17, 2000. *See* Attachment B.

[9] http://www.geothermal-energy.org/pdf/IGAstandard/WGC/2000/R0149.PDF, p. 706.

[10] *Ibid.*, p. 706

[11] *Ibid.*, p. 706

operation to travel and reach the hot springs and fish hatchery. Injection wells at geothermal plants carry not only spent brine but may include chemicals used to prevent biofouling, corrosion, and scaling of the plant equipment. The chemicals and the composition of the spent brine injected at the Mammoth-Pacific complex are not described in the DEIS/R. However, at other geothermal power plants, chemicals that are injected are known. For example, according to the U.S. EPA, chemicals injected at a geothermal plant in Hawaii include: sodium sulfite, benzoic acid, sodium hydroxide, sodium gluconate, dimethyldioctylammonium chloride, soya amine polyethoxylate, cychlohexlamine, polyamidoamino acetate, POE (15) tallow amine, sodium metabisulfite, cobalt compounds, sodium chloride, phosphoric acid derivative, magnesium nitrate, 5-chloro-2-methyl-4-isothiazoline-3-one, magnesium chloride, 2-methyl-4-isothiazolin-3-one, cupric nitrate, disodium ethylenebis-dithiocarbamate, dimethylamine, ethylene diamine, ethylene thiourea, and sulfuric acid.[12] The U.S. EPA has also documented that naturally occurring components of injected spent brine -- including total dissolved soilds, arsenic, chloride, fluoride, manganese, aluminum, lead, mercury, selenium, iron, cadmium, and zinc – may exceed drinking water standards.

I9-137 cont.

All injected fluids, including any fracking chemicals, spent brine, chemical additives, and motive fluids should be disclosed in a revised DEIS/R and evaluated for the potential to degrade groundwater quality and in interconnected spring water and surface water. If unmitigated, the release of spent brine, motive fluid and other chemicals to the aquifer and in turn to surface water is a significant unmitigated impact which would pose potential ecologic risk to aquatic resources. Chemicals used for drilling and operations may travel through interconnected pathways and reach the fish hatchery and Hot Creek. An ecological risk assessment should be conducted to evaluate this potential pathway to ensure protection of aquatic resources from any exposure to chemicals or to components of the spent brine.

Stormwater discharge issues

Well construction and drilling would require surfacing of drilling mud, drill cuttings, and water and geothermal fluid. Pipeline construction, to receive and deliver brine, would require trenching, grading, and disturbance of surface sediments. The DEIS/R notes that pollutants related to these activities can be entrained in stormwater and flow offsite, resulting in degradation of water quality (DEIR, p. 4.19-4). The DEIS/R does not analyze the impacts from such pollution on water quality.

I9-138

Mitigation measure SW-2 states that all containment basins and sumps will be constructed to contain flows from a 100-year storm event with sufficient freeboard (DEIR, p. 4.19-22). The DEIR's claim of construction of "sufficient freeboard" is vague. Hydrologic and engineering calculations should be used to determine the amount of freeboard necessary to contain any overtopping from flows anticipated from a 100-year storm event. Peak discharge flows during a 100-year storm event should be calculated and used to identify the size of containment basins and freeboard.

I9-139

Mitigation measure SW-1 states that a drainage plan will be prepared, to include location and sizing of stormwater retention facilities and on-site drainages. Stormwater facilities will be designed with the

I9-140

[12] http://www.epa.gov/ogwdw/uic/class5/pdf/study_uic-class5_classvstudy_volume17-geothermalelectricpower.pdf, p. 45 (attached as Exhibit 3).

capacity to retain a 20-year, 24-hour storm event. Figure 3.19-1 shows that the well sites will be located just outside a 100-year flood zone. Wells 35-31, 55-31, 55-32 and 65-32 are proposed to be located a few hundred feet north of the 100-year flood zone (DEIS/R, Figure 3.19-1). Wells 55-32 and 65-32 are located in areas that are tributaries to Hot Creek (DEIR, p. 4.19-3). Hot Creek, in turn, feeds into Mammoth Creek.

I9-140 cont.

Mammoth Creek is impaired for total dissolved solids and is on the 303(d) List of Impaired Water Bodies (DEIS/R, p. 3.19-2). In the event that a 100-year flood event occurs and overflows the proposed retention facilities, stormwater runoff, contaminated from well construction and operation, may flow into the creek and further degrade water quality. The proposed containment basins and sumps for the Project are to be built with a capacity to contain flows from a 100-year storm event. To be conservative, the Applicant should require that stormwater retention facilities also be constructed to contain flows from a 100-year flood event.

I9-141

A revised DEIS/R should be prepared to evaluate the potential for failure of the stormwater retention facilities and containment basins and sumps and the resulting water quality impacts. The drainage plan should be prepared prior to construction and included in a revised DEIS/R to ensure that adequate sizing and best management practices for managing stormwater runoff during Project construction and operation are in place.

I9-142

Adequate sizing and implementation of best management practices to minimize impacts from stormwater runoff should be discussed and identified in a Stormwater Pollution Prevention Plan (SWPPP). Appendix A to the DEIS/R shows that the Regional Water Quality Control Board required the Applicant to prepare a SWPPP if Project construction would disturb more than one acre (Appendix A, p. A-122). The Project proposes to construct 16 wells, each with a 0.4-acre well pad (for a possible total amount of 6.4 acres), and therefore, will disturb more than one acre of land. The DEIS/R states that appropriate measures such as preparation of a SWPPP will be used to control offsite discharges (DEIS/R, p. 4.3-3). A SWPPP should be prepared now and included with a revised DEIS/R to allow for independent review. The SWPPP should identify all construction activities, pollutants that may be generated during those activities, and best management practices to prevent contamination of stormwater runoff during well construction and operation.

I9-143

Sincerely,

Matt Hagemann, P.G., C.Hg.

Uma Bhandaram

Comments

Of the
California Unions for Reliable Energy

On
Joint Draft Environmental Impact Statement / Environmental Impact Report for ORNI 50 LLC's Casa Diablo IV Geothermal Development Project

Mono County

Prepared and Submitted
to the
U.S. Bureau of Land Management and the
Great Basin Unified Air Pollution Control District

ATTACHMENT C

January 29, 2013

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EXHIBIT C

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25 January 2013

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RE: Casa Diablo IV Project Impacts

Dear Mr. Reinhardt and Ms. Sudoimer:

This letter consists of my expert evaluation, associated comments, and recommendations on the joint Draft Environmental Impact Statement and Draft Environmental Impact Report (Draft EIS/EIR), prepared for the Casa Diablo IV Geothermal Project (Project) pursuant to the requirements of the National Environmental Policy Act (NEPA; 42 SC 4321 *et seq.*) and the California Environmental Quality Act (CEQA; Public Resources Code 2100-21178.1). The Bureau of Land Management (BLM) and the Great Basin Unified Air Pollution Control District (Air District) act as the lead agencies and authors of the Draft EIS/EIR. The agencies assert that the document sufficiently describes and evaluates the environmental impacts that are expected to result from construction, operation, maintenance, and decommissioning of the Project and presents Project Design Measures (PDMs) and mitigation measures.

I am an independent wildlife biologist, with nearly 40 years of professional experience during which I conducted research on, and worked with, large mammals (deer, mountain sheep, elk, and mountain lions) in eastern and southeastern California; more than 20 years were spent working on issues in the eastern Sierra Nevada and, specifically, in Inyo and Mono counties. I previously have served as a consultant to various clients on renewable energy projects — including wind, solar, and geothermal — and their potential impacts to mule deer and mountain sheep, and have testified before the California Energy Commission. I hold Bachelors and Masters Degrees in Zoology and Biology, respectively, from California State University Long Beach, and a Ph.D. in Wildlife Biology from the University of Alaska Fairbanks.

In my comments I offer a specific critique of issues related to the CD-IV Project as described in the Draft EIS/EIR — particularly those involving migratory mule deer, which utilize the project site on a semi-annual basis, as well as resident deer, which

occupy the project site on a year-round basis. I am personally familiar with the project site, and my professional background in ungulate ecology, extensive reviews of the contemporary scientific literature, and contacts with other experts on ungulate ecology that are familiar with the location of the Project provided the basis for the findings herein.

A. The Draft EIS/EIR Fails to Adequately Identify and Analyze the Importance of the Project Site to Mule Deer and Resulting Impacts to the Species

Migratory behavior of large mammals is one of the most spectacular, yet threatened, phenomena in the animal kingdom.[1] Mule deer inhabiting the eastern Sierra Nevada are among the large mammals well-known for their migratory behavior, and problems associated with development or intrusions, and effects on habitat fragmentation or alteration of movement corridors have been of substantial concern to managers and conservationists for many years.[2 3] Migration by mule deer clearly has fitness consequences for individuals, as well as ecosystem-level implications.[4 5] Migration by mule deer in the Sierra Nevada is a two-way phenomenon that occurs between areas used during winter and those used during the remainder of the year.[6 7 8] Thus, actions that prevent, or otherwise restrict, the potential for movement of mule deer between seasonal ranges have broad-sweeping implications, not only for the persistence of migratory behavior, but for continued ecosystem function.

Given that migration is a seasonal phenomenon that occurs on a semi-annual basis, the Draft EIS/EIR is woefully inadequate, because it addresses only use by deer during the fall migration, or by "resident" deer prior to the fall migration. Despite the fact that the Draft EIS/EIR acknowledges that the Proposed Action is located in an important mule deer migration path and staging area in the fall and spring, it reports only information on use by mule deer that was obtained during summer (for resident deer) and fall (for migratory deer); noticeably absent is any baseline information or analysis of impacts during the spring (for migratory deer).[9 10 11 12] Moreover, those data were obtained

I9-144

[1] Berger, J. 2004. The last mile: how to sustain long-distance migration in mammals. Conservation Biology 18:320-331.
[2] Kucera, T. E., and C. W. McCarthy. 1988. Habitat fragmentation and mule deer migration corridors: a need for evaluation. Western Section of The Wildlife Society Transactions 24:61–67.
[3] Kucera, T. E. 1992. Influences of sex and weather on migration of mule deer in California. Great Basin Naturalist 52:122–130.
[4] Nicholson, M.C., R.T. Bowyer, and J. G. Kie. 1997. Habitat selection and survival of mule deer: tradeoffs associated with migration. Journal of Mammalogy 78:483–504.
[5] Monteith, K. M., V. C. Bleich, T. R. Stephenson, B. M. Pierce, M. M. Conner, R. W. Klaver, and R. T. Bowyer. 2011. Timing of seasonal migration in mule deer: effects of climate, plant phenology, and life-history characteristics. Ecosphere 2(4):art47. doi:10.1890/ES10-00096.1
[6] Kucera, T. E. 1992. Influences of sex and weather on migration of mule deer in California. Great Basin Naturalist 52:122–130.
[7] Loft, E. R., R. C. Bertram, and D. L. Bowman. 1989. Migration patterns of mule deer in the central Sierra Nevada. California Fish and Game 75:11–19.
[8] Monteith, K. M., V. C. Bleich, T. R. Stephenson, B. M. Pierce, M. M. Conner, R. W. Klaver, and R. T. Bowyer. 2011. Timing of seasonal migration in mule deer: effects of climate, plant phenology, and life-history characteristics. Ecosphere 2(4):art47. doi:10.1890/ES10-00096.1
[9] Draft EIS/EIR page 1-12.

within a limited time frame (summer and fall 2011), rather than over a series of semi-annual migrations that would be necessary to fully understand, and develop mitigation for, the potential impacts of disruption of that migratory corridor.

The biological reports addressing mule deer issues have indicated the problematic nature of an absence of assessments over multiple years, small sample sizes, and the absence of data collected during spring. For example, routes used by mule deer during migration have been shown to be varied and reticulate over multiple migratory events.[13] The apparent assumption that project impacts would be identical during both spring and fall migrations is speculative at best, and patently wrong at worst. The potential for inter-annual variation in migration routes further confounds the utility of conclusions based on observations obtained during a single migration event. In the absence of information on the spring migration, and in the absence of more than a single year of information on occupancy and use of the project site by mule deer, the Draft EIS/EIR fails to provide an accurate portrayal of use of the Project site by mule deer. This information is critically important for decision makers to fully assess and provide adequate mitigation for the impacts of the Project. Moreover, differences between results obtained during spring and fall may act in synergism to amplify the effects of the project on mule deer and, thus, must be considered further in a cumulative sense. Additionally, the California Department of Fish and Game (now California Department of Fish and Wildlife [CDFW]) clearly identified a requirement to address deer use of the project site during spring migration, as requested in a letter to Mono County regarding the MP-1 replacement project, and its similar importance to the CD-IV Project, as emphasized by CDFW.[14] [15] The consultant has cautioned that, "Given the limited sampling duration, which encompasses a single migration event, the degree to which these results may be generalized to future years or regarded as describing "average use" cannot be known."[16] Indeed, sample size upon which the ability of deer to negotiate the existing Basalt Canyon Pipeline involved an assessment of only 23 attempted crossings.[17] Further, the shortcomings associated with assessing deer use during the unusually late snow conditions also have been recognized.[18]

I9-144 cont.

The Draft EIS/EIR acknowledges that, "Potential interactions between deer and proposed project elements arise from the reasonable notions that migrating deer will not exhibit tolerance to new power plant noise and activity and will not readily adapt to movement

[10] Paulus, J. 2011. Fall 2011 resident deer survey for the Casa Diablo, Basalt Canyon, and upper Basalt geothermal areas. 30 October 2011.
[11] Paulus, J. 2012. Fall 2011 migratory deer survey for the Casa Diablo, Basalt Canyon, and upper Basalt geothermal areas. 10 February 2012.
[12] Draft EIR/EIS page 3.4-1.
[13] Sawyer, H., M. J. Kaufmann, and R. M. Nielson. 2009. Influence of well pad activity on winter habitat selection patterns of mule deer. Journal of Wildlife Management 73:1052–1061.
[14] Letter from B. Henderson (CDFG) to D. Lyster (Mono County) dated 7 March 2011.
[15] Santos, N. 2011. G-1 Replacement Plant Site Visit Summary dated 22 March 2011.
[16] Paulus, J. 2012. Fall 2011 migratory deer survey for the Casa Diablo, Basalt Canyon, and upper Basalt geothermal areas. 10 February 2012.
[17] Paulus, J. 2011. Memorandum to Ron Leiken, Ormat Corporation, dated 29 December 2011.
[18] Paulus, J. 2012. Fall 2011 migratory deer survey for the Casa Diablo, Basalt Canyon, and upper Basalt geothermal areas. 10 February 2012.

across new aboveground pipelines associated with geothermal energy production."[19] The Draft EIS/EIR further states that, "[m]igratory deer ... may not remain long enough to adapt and may be thwarted in their habitat usage for movement along traditional paths by any new installation of linear barriers."[20] Unfortunately, the Draft EIS/EIR fails to analyze these stated potentially significant impacts, relying on a finding that "[t]here [are] not sufficient data to speculate how migrating deer would respond to the new barriers associated with the Proposed Action."[21] This rationale is untrue; scientific literature to the contrary is readily available and that literature addresses the fact that energy development activities yield indirect losses of habitat that are substantially greater than those associated with direct losses, and that acclimation by mule deer to disturbances did not occur over a period of three years.[22] Moreover, numerous recent studies have reiterated the potential for migrating mule deer to be affected by a variety of energy development projects, including geothermal development.[23] [24] [25] [26] [27] By failing to disclose the necessary information, the EIS/EIR analysis of potentially significant impacts is fundamentally flawed. The public and the decision makers are subsequently led to believe that abandonment of habitat is unlikely and impacts are less than significant.[28]

I9-144 cont.

The Draft EIS/EIR relies exclusively on information contained in reports suggesting that the only mule deer that crossed through the proposed Project site during migration were two individuals that had been fitted with GPS telemetry collars.[29] The suggestion made by the report that a "migration route" can be firmly established is in direct conflict with existing scientific evidence.[30] At least 37 female mule deer were fitted with GPS telemetry collars in Round Valley, Inyo and Mono counties, and then tracked during 2002–2004.[31] The Draft EIS/EIR relies on misleading information as an example of deer

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[19] Draft EIS/EIR page 4.4-16.
[20] Draft EIS/EIR page 4.4-16.
[21] Draft EIS/EIR page 4.4-17.
[22] Sawyer, H., R. M. Nielson, F. Lindzey, and L. L. McDonald. 2006. Winter habitat selection of mule deer before and during development of a natural gas field. Journal of Wildlife Management 70:396–403.
[23] Sawyer, H., R. M. Nielson, F. Lindzey, and L. L. McDonald. 2006. Winter habitat selection of mule deer before and during development of a natural gas field. Journal of Wildlife Management 70:396–403.
[24] Sawyer, H., M. J. Kaufmann, and R. M. Nielson. 2009. Influence of well pad activity on winter habitat selection patterns of mule deer. Journal of Wildlife Management 73:1052--1061.
[25] Lutz, D. W., J. R. Heffelfinger, S. A. Tessmann, R. S. Gamo, and S. Siegel. 2011. Energy development guidelines for mule deer. Western Association of Fish and Wildlife Agencies, Cheyenne, Wyoming, USA.
[26] Hebbelwhite, M. 2008. A literature review of the effects of energy development on ungulates: implications for central and eastern Montana. Contract report prepared for the Montana Department of Fish, Wildlife, and Parks, Miles City, USA.
[27] Hebbelwhite, M. 2011. Effects of energy development on ungulates. Pages 71–94 in D. E. Naugle, editor. Energy development and wildlife conservation in western North America. Island Press, Washington, D.C., USA.
[28] Draft EIS/EIR page 4.4-16.
[29] Paulus, J. 2012. Fall 2011 migratory deer survey for the Casa Diablo, Basalt Canyon, and upper Basalt geothermal areas. 10 February 2012.
[30] Sawyer, H., M. J. Kaufmann, and R. M. Nielson. 2009. Influence of well pad activity on winter habitat selection patterns of mule deer. Journal of Wildlife Management 73:1052–1061.
[31] Ferranto, S. P. 2006. Conservation of mule deer in the eastern Sierra Nevada. M.S. thesis, University of Nevada, Reno, USA.

movements, rather than a more meaningful population-level assessment of the Project site in terms of its population-level or landscape-level value to mule deer. Indeed, approximately 12 collared animals occurred on or near the project site during 2002–2004, based on my ocular assessment of data presented elsewhere.[32]

The Draft EIS/EIR clearly acknowledges that there will be direct losses of mule deer habitat, but fails to disclose the potentially significant impacts of those losses. For example, bitterbrush is an extremely important component of mule deer diets and is critically important to mule deer occupying the eastern Sierra Nevada.[33] [34] The Draft EIS/EIR fails to address the effects of habitat loss, both direct and indirect, on availability of bitterbrush and other shrub components of sagebrush scrub habitats associated with the project site because it does not consider the secondary impacts of the loss of nutritional resources; nutritional resources are extremely important in the life-history strategies of ungulates, and nutrient availability is critically important to the performance of mule deer in the eastern Sierra Nevada.[35] [36] [37] Loss of nutrient resources associated with direct impacts to foraging habitat or secondary impacts to habitat use resulting from avoidance of the Project and vicinity have implications for individuals that may be affected by the development and, ultimately, for the population of mule deer.

I9-144 cont.

B. The Draft EIS/EIR Fails to Adequately Identify and Analyze the Potential for the Project to Yield Increased Mortality Resulting From Vehicle Collisions

I9-145

Highway associated impacts are among the most prevalent and widespread stressors of natural ecosystems, and are especially severe in the western United States as a result, in part, of increased energy development activities.[38] [39] Mortality due to vehicle collision is an important source of death among mule deer throughout the range of the species and particularly in Mono County in the eastern Sierra Nevada, where it is the main cause of unintended deer mortality.[40] [41] The Draft EIS/EIR acknowledges the potential for vehicle

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[32] Ferranto, S. P. 2006. Conservation of mule deer in the eastern Sierra Nevada. M.S. thesis, University of Nevada, Reno, USA.

[33] Monteith, K. M., V. C. Bleich, T. R. Stephenson, B. M. Pierce, M. M. Conner, R. W. Klaver, and R. T. Bowyer. 2011. Timing of seasonal migration in mule deer: effects of climate, plant phenology, and life-history characteristics. Ecosphere 2(4):art47. doi:10.1890/ES10-00096.1

[34] Pierce, B. M., V. C. Bleich, K. L. Monteith, and R. T. Bowyer. 2012. Top-down versus bottom-up forcing: evidence from mountain lions and mule deer. Journal of Mammalogy 93:977–988.

[35] Parker, K. L., P. S. Barboza, and M. P. Gillingham. 2009. Nutrition integrates environmental responses of ungulates. Functional Ecology 23:57–69.

[36] Monteith, K. M., V. C. Bleich, T. R. Stephenson, B. M. Pierce, M. M. Conner, R. W. Klaver, and R. T. Bowyer. 2011. Timing of seasonal migration in mule deer: effects of climate, plant phenology, and life-history characteristics. Ecosphere 2(4):art47. doi:10.1890/ES10-00096.1

[37] Pierce, B. M., V. C. Bleich, K. L. Monteith, and R. T. Bowyer. 2012. Top-down versus bottom-up forcing: evidence from mountain lions and mule deer. Journal of Mammalogy 93:977–988.

[38] Farrell, J. E., L. R. Irby, and P. T. McGowan. 2002. Strategies for ungulate-vehicle collision mitigation. Intermountain Journal of Sciences 8:1–18.

[39] Heffelfinger, J. R., and T. A. Messmer. 2002. Introduction. Pages 1–11 *in* J. C. deVos, M. R. Conover, and N. E. Headrick, editors. Mule deer conservation: issues and management strategies. Jack H. Berryman Institute Press, Utah State University, Logan, USA.

[40] V. C. Bleich, California Department of Fish and Game (retired), personal observations 1986–2007.

collisions to increase as a result of the proposed project.[42] No information on the current level of vehicular collisions is in the area is provided; this information, however, is readily available from the California Department of Transportation.[43] [44] Information identifying deer-vehicle collision "hot spots" in the eastern Sierra Nevada exists, two of which have been identified near the project site.[45] In the absence of an assessment of current cause-specific mortality rates, the Draft EIS/EIR fails to provide a meaningful way of assessing what the impacts of an increase in vehicle deaths among mule deer resulting from the Proposed Action would be. It has been established that numerous deer from the Round Valley population are killed in vehicle collisions along U.S. Highway 395 on an annual basis, and collisions with vehicles also accounted for about 15% of known sources of mortality among a sample of female deer from the Casa Diablo population.[46] [47]

I9-145 cont.

"The location of the new power plant and the pipelines running south of it in the Proposed Action would introduce new barriers to mule deer migration moving down slope from north to south to access meadow and riparian communities associated with Mammoth Creek. It is not known whether this would force some migrating deer further west and closer to U.S. Highway 395 where they would be subject to increased mortality due to vehicular collisions."[48] However, implementation of alternative 2 has the potential to reduce the mortality of deer resulting from vehicle collisions, but at the cost of increased impedance to deer movements due to additional pipeline construction.[49] In the absence of data to the contrary, any increase in the current level of mortality resulting from vehicle collisions must be considered to be additive, and additive mortality has the potential to significantly influence the performance of ungulate populations.[50] Thus, the Draft EIS/EIR fails in its discussion of the impacts of potential increases in vehicle collisions in a manner that cannot be evaluated, because the document fails to provide baseline information relative to the current rate of vehicle collisions.

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[41] Mono County Planning Department. 2001. Master environmental assessment for Mono County. Mono County Planning Department, Bridgeport, California, USA. Available at: < http://www.monocounty.ca.gov/sites/default/files/fileattachments/planning_division/page/812/2001_mea_and_maps_color.pdf>

[42] Joint EIR, page 2-77.

[43] Ferranto, S. P. 2006. Conservation of mule deer in the eastern Sierra Nevada. M.S. thesis, University of Nevada, Reno, USA.

[44] T. J. Taylor, California Department of Fish and Wildlife, personal communication. 13 December 2012.

[45] Ferranto, S. P. 2006. Conservation of mule deer in the eastern Sierra Nevada. M.S. thesis, University of Nevada, Reno, USA.

[46] Pierce, B. M., V. C. Bleich, and R. T. Bowyer. 2000. Selection of mule deer by mountain lions and coyotes: effects of hunting style, body size, and reproductive status. Journal of Mammalogy 81:462–172.

[47] Bleich, V. C., and T. J. Taylor. 1998. Survivorship and cause-specific mortality in five populations of mule deer. Great Basin Naturalist 58:265–272.

[48] Draft EIS/EIR page 4.4-17.

[49] Draft EIS/EIR, page 4.4-21.

[50] Bowyer, R. T., D. K. Person, and B. M. Pierce. 2005. Detecting top-down versus bottom-up regulation of ungulates by large carnivores: implications for conservation of biodiversity. Pages 342–361 *in* J. C. Ray, K. H. Redford, R. S. Steneck, and J. Berger, editors. Large carnivores and the conservation of biodiversity. Island Press, Washington, D.C., USA.

C. The Draft EIS/EIR Fails to Acknowledge Prior Planning Documents That Emphasize the Protection of Mule Deer Habitat and Areas Through Which They Move During Migration

The mule deer is an important game species. The impacts of geothermal development on the Round Valley (i.e., the Sherwin Grade and Buttermilk deer herds combined) and Casa Diablo deer herds have been a longstanding management concern of CDFW, and the importance of protecting areas through which deer move during migration has long been emphasized.[51] [52] [53] Much, if not all, of the proposed Project falls outside of the jurisdiction of the city of Mammoth Lakes in Mono County.[54] Mule deer habitat and areas through which mule deer move during migration in Mono County have been of great concern to planners, and the recently revised Mono County General Plan depicts the Project area as being entirely within what the County refers to as the Hot Creek Deer Migration Zone.[55] Further, Mono County has identified deer as an important natural, biological, and recreational resource, and noted that geothermal exploration, development and operations shall be undertaken in a manner that minimizes or prevents adverse effects to the deer population and migration within the deer migration zones.[56]

I9-147

Mono County's General Plan states: "[p]rojects outside community areas within identified deer habitat areas, including migration corridors or winter range (see the Biological Resources Section of the Master Environmental Assessment), which may have a significant effect on deer resources shall submit a site-specific deer study performed by a recognized and experienced deer biologist in accordance with Action 1.1."[57] The aforementioned "[s]ite-specific deer study" has failed to provide information adequate to assess the potential impacts of the proposed project on mule deer, as noted in Section A, above, because those studies failed to address spring migration. Moreover, it is my opinion that the deer investigations upon which conclusions were drawn[58] [59] were not performed by a "[r]ecognized and experienced deer biologist" as stipulated in the General

[51] Blankinship, T. E. 1984. Buttermilk deer herd management plan. California Department of Fish and Game, Bishop, USA.
[52] Thomas, R. D. 1985. Management plan for the Sherwin Grade deer herd. California Department of Fish and Game, Bishop, USA.
[53] Thomas, R. D. 1985. Management plan for the Casa Diablo deer herd. California Department of Fish and Game, Bishop, USA.
[54] Draft EIS/EIR, page 1-5.
[55] County of Mono Community Development Department. 2010. Mono County General Plan. Bridgeport, California, USA. (Drafted July 1997; Revised 2010). Conservation /Open Space Element-2012, Figure 1. Available at: <http://www.monocounty.ca.gov/sites/default/files/fileattachments/planning_division/page/812/2012_conservation.open_space_element.pdf>
[56] Draft EIS/DIR page 3.10-10.
[57] County of Mono Community Development Department. 2010. Mono County General Plan. Bridgeport, California, USA. (Drafted July 1997 and Revised 2010). Page V-14. Available at: <http://www.monocounty.ca.gov/sites/default/files/fileattachments/planning_division/page/812/2012_conservation.open_space_element.pdf>
[58] Paulus, J. 2012. Fall 2011 migratory deer survey for the Casa Diablo, Basalt Canyon, and upper Basalt geothermal areas. 10 February 2012.
[59] Paulus, J. 2011. Fall 2011 resident deer survey for the Casa Diablo, Basalt Canyon, and upper Basalt geothermal areas. 30 October 2011.

Plan. The biologist that prepared the reports has a fine reputation as a botanical consultant, but queries of web-based literature search engines using "deer" and "Paulus" failed to yield any professional publications that would establish him as a "[r]ecognized and experienced deer biologist."[60] [61] Thus, the reports upon which the Draft EIS/EIR is based failed to meet the criteria established by Mono County.[62]

The U.S. Forest Service has identified the conservation of mule deer habitat and areas used by mule deer during migration as important biological resources and has, by reference, incorporated management plans — and, thereby, management objectives — for the Round Valley (i.e., Sherwin Grade Deer Herd and Buttermilk Deer Herd combined) and Casa Diablo deer herds published by CDFW into their planning documents.[63] The Inyo National Forest Land and Resource Management Plan also emphasizes the maintenance and enhancement of the integrity of key mule deer winter ranges, holding areas, migration routes, and fawning areas.[64] [65] Deer and deer habitat clearly are an important resource to the Inyo National Forest. Nevertheless, the Forest Service does not appear to have provided assurances that impacts were appropriately analyzed or mitigated to the extent possible to ensure the viability of deer migration corridors.[66]

I9-147 cont.

D. The DEIR Does Not Address the Project's Cumulative Impacts to Mule Deer

Cumulative impacts to mule deer include permanent habitat loss, loss of forest cover, loss of special use areas, blockage of areas through which deer move during migration, disturbance, and altered predator-prey relationships. The Draft EIS/EIR provides insufficient analysis of the Project's contribution to these cumulative impacts. Specifically, the Draft EIS/EIR suffers two fundamental flaws:

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1. The Draft EIR/EIS fails to fully identify infrastructure development and activities that will affect deer use. As a result, the DEIR lacks the information needed to evaluate the cumulative impacts of the Project.

2. The Draft EIR/EIS lacks an analysis of cumulative impacts to deer that will result if the project is developed, particularly with respect to deer movements, which have implications at the levels of the individual, the population(s), and the ecosystem. In the

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[60] Google Scholar. Available at http://scholar.google.com/schhp?hl=en
[61] Proquest. Available at http://search.proquest.com/
[62] County of Mono Community Development Department. 2012. Mono County General Plan. Bridgeport, California, USA. Page V-14. Available at: <http://www.monocounty.ca.gov/sites/default/files/fileattachments/planning_division/page/812/2012_conservation.open_space_element.pdf>
[63] U.S. Forest Service. 1988. Inyo National Forest Plan. Appendix A:398–206. Available at: <http://www.fs.usda.gov/Internet/FSE_DOCUMENTS/stelprdb5352771.pdf>
[64] U.S. Forest Service. 1988. Inyo National Forest Plan. Forest plan standards and guidelines. Chapter IV:98–99. Inyo National Forest, Bishop, California, USA. Available at: <http://www.fs.usda.gov/Internet/FSE_DOCUMENTS/fsbdev3_003621.pdf>
[65] Draft EIS/EIR page 3.10-6.
[66] Draft EIS/EIR page 1-10.

absence of baseline information, it is not possible for the Draft EIS/EIR to fully anticipate and analyze the cumulative impacts of the Project.

The abundance of high-quality forage that is generally not available on deer winter range makes the Project site, which is located within the Sherwin Holding Area, a critically important component of habitat used during the annual cycles of the Round Valley and Casa Diablo deer herds.[67] [68] The area identified for project development is crossed during the fall migration by deer moving southward from higher elevations or from west of the Sierra crest.[69] [70] [71] [72] During spring, mule deer from the Round Valley and Casa Diablo deer herds move northward and westward through the Sherwin Holding Area.[73] [74]

I9-148 cont.

The nutritional content of forage has an influence on nearly every life history component of mule deer, including survival and reproduction.[75] The proposed project is located within the Sherwin Holding Area, and the presence of resident and migratory deer in the Project area establishes it as deer habitat with available and high-quality, forage.[76] The Project will eliminate up to 80 acres of habitat within the holding area.[77] More importantly, though, shifts in deer use away from the project area (i.e., avoidance of the project area by mule deer) can, and should, be expected but such shifts are not adequately addressed.[78] [79] Additionally, there is serious concern over the potential to indirectly affect habitat quality by spreading invasive species of vegetation, as pointed out by CDFW during the scoping process.[80] [81] [82] Invasions of exotic species, such as cheatgrass,

[67] Thomas, R. D. 1985. Management plan for the Sherwin Grade deer herd. California Department of Fish and Game, Bishop, USA.
[68] Thomas, R. D. 1985. Management plan for the Casa Diablo deer herd. California Department of Fish and Game, Bishop, USA.
[69] Kucera, T. E. 1988. Ecology and population dynamics of mule deer in the Eastern Sierra Nevada, California. Ph.D. dissertation, University of California, Berkeley, USA.
[70] Taylor, T, 1988. Casa Diablo deer study: Migration and seasonal habitats of the Casa Diablo deer herd. Unpublished report prepared for California Department of Fish and Game, Bishop, USA.
[71] Ferranto, S. P. 2006. Conservation of mule deer in the eastern Sierra Nevada. M.S. thesis, University of Nevada, Reno, USA.
[72] Paulus, J. 2012. Fall 2011 migratory deer survey for the Casa Diablo, Basalt Canyon, and upper Basalt geothermal areas. 10 February 2012.
[73] Ferranto, S. P. 2006. Conservation of mule deer in the eastern Sierra Nevada. M.S. thesis, University of Nevada, Reno, USA.
[74] Monteith, K. L., V. C. Bleich, T. R. Stephenson, and B. M. Pierce. 2009. Population dynamics of mule deer in the eastern Sierra Nevada: implications of nutritional condition. California Department of Fish and Game, Bishop, USA.
[75] Monteith, K. L., V.C. Bleich, T.R. Stephenson, B. M. Pierce, M. M. Conner, R. W. Klaver, and R. T. Bowyer. 2011. Timing of seasonal migration in mule deer: effects of climate, plant phenology, and life-history characteristics. Ecosphere 2(4):1–34.
[76] Paulus, J. 2012. Fall 2011 migratory deer survey for the Casa Diablo, Basalt Canyon, and upper Basalt geothermal areas. 10 February 2012.
[77] Draft EIS/EIR page 4.4-27.
[78] Sawyer, H., R. M. Nielson, F. Lindzey, and L. L. McDonald. 2006. Winter habitat selection of mule deer before and during development of a natural gas field. Journal of Wildlife Management 70:396–403.
[79] Sawyer, H., M. J. Kaufmann, and R. M. Nielson. 2009. Influence of well pad activity on winter habitat selection patterns of mule deer. Journal of Wildlife Management 73:1052–1061.
[80] Draft EIS/EIR page A-14.

have altered Great Basin ecosystems, and have resulted in deaths of native shrubs from excessive fire intensity, inability of native species to compete with cheatgrass, and subsequent rapid domination by cheatgrass following fires.[83] [84] Bitterbrush, a valuable forage species that occurs on the project site, is extremely important to mule deer, and is one of the native species adversely affected by cheatgrass invasions.[85] [86]

The Round Valley Deer Herd has declined substantially during the last 25 years, from approximately 6,000 individuals in 1985, reaching a low in 1990 of about 950 animals, and then increasing to about 1,900 individuals in 2009.[87] [88] The primary cause of the decline appears to have been a decrease in carrying capacity.[89] Given the importance of nutrient intake to the population performance of mule deer, additional declines in the number of deer inhabiting Round Valley could occur with habitat modifications associated with development of the Project, both in terms of direct habitat loss as well as decreases in habitat use because deer do not occupy the area immediately adjacent to developed sites.[90] [91] Because the Project will affect habitat used by the herd during migration, it will exacerbate the current stressors experienced by the population, and could lead to a further decline in numbers. The Project's potential to contribute further to the decline could be cumulatively considerable as a result of the loss of foraging habitat or forage itself, and must be considered in that context to fully understand its implications for the continued health of the Round Valley Deer Herd, as well as the Casa Diablo Deer Herd.

Other factors make it impossible for the Draft EIS/EIR to have fully assessed cumulative impacts of the Project on mule deer. For example, one of the deer studies focused on the impacts of the proposed Project on "migratory" deer, whereas the other focused on the impacts of the Project on "resident" deer.[92] [93] Further, as pointed out previously, no

I9-148 cont.

[81] Santos, N. 2011. G-1 Replacement Plant Site Visit Summary dated 22 March 2011.
[82] Letter from B. Henderson (CDFW) to D. Lyster (Mono County) dated 7 March 2011.
[83] Young, J. A., R. A. Evans, and B. L. Kay. 1987. Cheatgrass. Rangelands 9:266-270
[84] Vollmer, J. G., J. L. Vollmer, K. Schoup, and R. Amundson. 2005. Controlling cheatgrass in winter range to restore habitat and endemic fire. Deer and Elk Workshop 6:20-24.
[85] Kucera, T. E. 1988. Ecology and population dynamics of mule deer in the Eastern Sierra Nevada, California. Ph.D. dissertation, University of California, Berkeley, USA.
[86] Pierce, B. M., V. C. Bleich, K. L. Monteith, and R. T. Bowyer. 2012. Top-down versus bottom-up forcing: evidence from mountain lions and mule deer. Journal of Mammalogy 93:977–988.
[87] Pierce, B. M., V. C. Bleich, K. L. Monteith, and R. T. Bowyer. 2012. Top-down versus bottom-up forcing: evidence from mountain lions and mule deer. Journal of Mammalogy 93:977–988.
[88] Monteith, K. L., T. R. Stephenson, V. C. Bleich, M. M. Conner, B. M. Pierce, and R. T. Bowyer. *In press.* Risk-sensitive allocation in seasonal dynamics of fat and protein reserves in a long-lived mammal. Journal of Animal Ecology.
[89] Monteith, K. L., V. C. Bleich, T. R. Stephenson, and B. M. Pierce. 2009. Population dynamics of mule deer in the eastern Sierra Nevada: implications of nutritional condition. California Department of Fish and Game, Bishop, USA.
[90] Sawyer, H., R. M. Nielson, F. Lindzey, and L. L. McDonald. 2006. Winter habitat selection of mule deer before and during development of a natural gas field. Journal of Wildlife Management 70:396–403.
[91] Sawyer, H., M. J. Kaufmann, and R. M. Nielson. 2009. Influence of well pad activity on winter habitat selection patterns of mule deer. Journal of Wildlife Management 73:1052–1061.
[92] Paulus, J. 2012. Fall 2011 migratory deer survey for the Casa Diablo, Basalt Canyon, and upper Basalt geothermal areas. 10 February 2012.

information on the presence of movements of migratory deer during spring were presented. Although impacts of the Project would contribute cumulatively to both resident and migratory mule deer, there is no coherent, overarching analysis or discussion of the manner in which the Project will affect mule deer or deer migration. This is a fundamental flaw, and can only be addressed with additional information obtained during periods of spring migration, and over an extended timeline; hence, it is not possible to fully assess cumulative impacts associated with the Project.

Track counts along transects provide a measure of relative use and can be used as an index to deer activity or presence, but interpretation of data are subject to numerous assumptions.[94] [95] Track surveys in and of themselves cannot be used to estimate the absolute number of deer using a particular area, but density estimates can be derived if additional assumptions are met.[96] Data presented in the Draft EIS/EIR are not adequate to allow the derivation of density estimates. Nevertheless, the most recent estimate of deer wintering in Round Valley was reported to be approximately 2,200 individuals,[97] as referenced by others.[98] Although that figure is cited in the Draft EIS/EIR, information that I have been able to obtain does not include population estimates.[99] [100]

I9-148 cont.

Based on my ocular estimate using information available elsewhere, about12 telemetered deer used, or occurred in the vicinity of, the Project site during migration.[101] A total of 37 individuals, however, actually were telemetered. Thus, animals telemetered with GPS collars in the Round Valley population and detected within — or near — the Project site potentially represented 32% of the individuals that could have been expected to be present ([12/37] × 100 = 32), assuming no bias in the distribution of the collars. If animals from both the Casa Diablo herd (population estimate 2,800) and Round Valley herd (population estimate 2,200) used the project site equally, up to 5,000 individuals could have passed through the area.[102] [103] That, however, is unlikely because only deer

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[93] Paulus, J. 2011. Fall 2011 resident deer survey for the Casa Diablo, Basalt Canyon, and upper Basalt geothermal areas. 30 October 2011.

[94] Paulus, J. 2012. Fall 2011 migratory deer survey for the Casa Diablo, Basalt Canyon, and upper Basalt geothermal areas. 10 February 2012.

[95] Keegan T. W., B. B. Ackerman, A. N. Aoude, L. C. Bender, T. Boudreau, L. H. Carpenter, B. B. Compton, M. Elmer, J. R. Heffelfinger, D. W. Lutz, B. D. Trindle, B. F. Wakeling, and B. E. Watkins. 2011. Methods for monitoring mule deer populations. Western Association of Fish and Wildlife Agencies, Cheyenne, Wyoming, USA.

[96] Overton, W. S. 1969. Estimating the numbers of animals in wildlife populations. Pages 403–456 *in* R. H. Giles, Jr., editor. Wildlife management techniques. Third edition (revised). The Wildlife Society, Washington, D.C., USA. (As cited by Keegan et al. [2011]).

[97] California Department of Fish and Game. 2011. January 2011 and March 2011 deer census data. California Department of Fish and Game, Bishop, USA. (Unable to locate this document).

[98] Final EIS/EIR, p. 3.4-17.

[99] McKeever, J. 2011a. Deer survey summary, post season - 2010. Unpublished memo dated 24 January 2011. California Department of Fish and Game. California Department of Fish and Game, Bishop, USA.

[100] McKeever, J. 2011b. Deer survey summary, spring 2011. Unpublished memo dated 11 April 2011. California Department of Fish and Game, Bishop, USA.

[101] Ferranto, S. P. 2006. Conservation of mule deer in the eastern Sierra Nevada. M.S. thesis, University of Nevada, Reno, USA.

[102] Final EIS/EIR, p. 3.4-17.

from Round Valley were collared. But, if Round Valley deer occurred on, or near, the project site in the same proportion in which they were collared, up to 700 (32% of 2,200) deer could have used the area. This figure is substantially greater than the maximum of 170 deer postulated to have used the project site over an 8-day period in May 2011, a number that was inappropriately derived from unreliable data.[104] [105] Neither of these numbers is likely "correct", but given the discrepancy between them, it is probable that cumulative impacts to individuals, the population, and ecosystem services could be far greater than indicated in the Draft EIS/EIR.

Many of the deer migrating northward and westward through the project site from the Round Valley winter range, or northward and westward from the Casa Diablo winter range continue on to summer ranges west of the Sierra crest, but there has been a substantial decrease in the proportion of animals doing so.[106] Continuing declines in the number of deer moving to the west slope of the Sierra Nevada could result in shifts in the availability of nutrients on the summer range: fewer deer could be present as a result of project implementation, and this potentiality must be discussed cumulatively in an ecosystem-level context. Further, climate change has been linked to a general shift from snowfall to rainfall in the western United States.[107] If such a trend continues, selection could favor migratory ungulates that take advantage of enhanced availability of resources resulting from a warming climate, and partial migration may become a better evolutionary strategy.[108] Given the value of the Sherwin Holding Area both to resident and migratory mule deer, the potential for the Project to yield exacerbated negative impacts must be discussed in (1) the context of direct loss of habitat resulting from development; (2) the indirect losses of habitat because deer avoid an area within some distance threshold around the Project; and (3) changes in habitat quality that will result from the likely proliferation of invasive species. Thus, the cumulative impacts of the project could extend far beyond the present and into the future, and have implications for evolutionary and ecosystem-level processes as well.[109]

I9-148 cont.

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[103] V. Bleich was unable to locate any documents substantiating the population estimates of 2,800 and 2,200 deer comprising the Casa Diablo and Round Valley deer populations, as reported in the Final EIS/EIR.

[104] Santos, N., and T. A. Reed. 2011. Deer track count surveys. MACTEC Project Number 4306080009.

[105] Cashen, S. 2011. 2011. Comments on the draft environmental impact report for the Mammoth Pacific I replacement project. Letter dated 22 August 2011 to Ms. Elizabeth Klebaner, Adams, Broadwell, Joseph, & Cardozo, South San Francisco, California, USA.

[106] Monteith, K. M., V. C. Bleich, T. R. Stephenson, B. M. Pierce, M. M. Conner, R. W. Klaver, and R. T. Bowyer. 2011. Timing of seasonal migration in mule deer: effects of climate, plant phenology, and life-history characteristics. Ecosphere 2(4):art47. doi:10.1890/ES10-00096.1

[107] Knowles, N., M. D. Dettinger, and D. R. Cayan. 2005. Trends in snowfall versus rainfall in the Western
United States. Journal of Climate 19:4545–4559.

[108] Kaitala, A., V. Kaitala, and P. Lundberg. 1993. A theory of partial migration. American Naturalist 142:59–81.

[109] Monteith, K. L., V.C. Bleich, T.R. Stephenson, B. M. Pierce, M. M. Conner, R. W. Klaver, and R. T. Bowyer. 2011. Timing of seasonal migration in mule deer: effects of climate, plant phenology, and life-history characteristics. Ecosphere 2(4):1–34.

E. The Draft EIS/EIR Fails to Adequately Mitigate for Impacts to Mule Deer

The cumulative impacts to mule deer include a decrease in forage availability that will occur as a result of infrastructure development, a decrease in forage availability that will result as a secondary effect as deer avoid use of habitat adjacent to the project, potential blockage of areas that deer move through during migration, and potential increases in mortality resulting from vehicle collisions, all of which impact individual deer but, ultimately, have population-level and even ecosystem-level consequences. The Draft EIS/EIR does not adequately discuss these impacts, in part because the information on which conclusions drawn in the Draft EIS/EIR is incomplete and, thereby, inadequate to formulate suitable mitigation measures. For example, a single seasonal survey of tracks of resident deer during fall, and a single track survey of deer conducted during the fall migration are the only data presented and analyzed.[110] [111] Moreover, there has been no work conducted on the Project site during the spring migration, a phenomenon that is as important as is fall migration, and perhaps even more so from a nutritional perspective. I9-149

In the Draft EIS/EIR, Project Design Measure for Environmental Protection BIO-1 proposes that, "A qualified wildlife biologist will walk the pipeline route once each year for the first three years following completion of construction to survey for any signs that the pipeline is impeding wildlife movement. If such evidence is found, the USFS *may require* ORNI 50, LLC to clear one or more areas under the pipeline of at least 16 inches height, or sufficient to allow wildlife to pass under the pipeline, at the points where movement is impeded."[112] BIO-1 is fundamentally flawed due to the vagaries associated with interpreting results of track surveys and the influences of seasonal variation — both within and among years — on deer habitat use and deer movement patterns and resultant influences on survey results.[113] Given these limitations, meaningful information cannot be derived from any such annual "walk" along the pipeline. In the absence of meaningful information, there is no evidence to support the argument that additional elevated pipeline segments would be an effective PDM for environmental protection, as stated in BIO-1.[114] I9-150

A minimum of approximately 16 inches above ground height has been the general scientific community's, recommendation for *fences* in areas occupied by mule deer.[115] Nevertheless, the data included in the Draft EIS/EIR are insufficient to conclude that a *pipeline* of that elevation will allow unimpeded passage of those large ungulates and,

[110] Paulus, J. 2011. Fall 2011 resident deer survey for the Casa Diablo, Basalt Canyon, and upper Basalt geothermal areas. 30 October 2011.
[111] Paulus, J. 2012. Fall 2011 migratory deer survey for the Casa Diablo, Basalt Canyon, and upper Basalt geothermal areas. 10 February 2012.
[112] Draft EIS/EIR page 2-48. (emphasis added).
[113] Keegan T. W., B. B. Ackerman, A. N. Aoude, L. C. Bender, T. Boudreau, L. H. Carpenter, B. B. Compton, M. Elmer, J. R. Heffelfinger, D. W. Lutz, B. D. Trindle, B. F. Wakeling, and B. E. Watkins. 2011. Methods for monitoring mule deer populations. Western Association of Fish and Wildlife Agencies, Cheyenne, Wyoming, USA.
[114] Draft EIS/EIR page 2-48.
[115] Bleich, V. C., J. G. Kie, E. R. Loft, T. R. Stephenson, M. W. Oehler, Sr., and A. L. Medina. 2005. Managing rangelands for wildlife. Pages 873–897 *in* C. E. Braun, editor. The wildlife management techniques manual. Sixth edition. The Wildlife Society, Bethesda, Maryland, USA.

thus, cannot be considered a viable recommendation. There is no guarantee that any aspect of BIO-1 is enforceable *in the absence of wording that will require action.* Moreover, even if a requirement to "[c]lear one or more areas under the pipeline of at least 16 inches height, or to allow wildlife to pass under the pipeline" was stipulated, BIO-1 is so non-specific that it cannot be interpreted to guarantee that any action will be taken to mitigate impacts to blockage of movements by mule deer. Wildlife is a term that can be applied to virtually any species of terrestrial vertebrate; mule deer are the largest native terrestrial vertebrates that occur on the project site, and there must be assurances that any resulting modification(s) will meet passage requirements of mule deer. Additionally, the ability of mule deer to cross under a pipeline constructed 16" above the ground will vary with snow accumulation, a consideration that must be addressed in detail.

I9-150 cont.

Mitigation measures proposed (for alternatives 1 and 3 only) include the construction of a "[d]eer crossing... [that will resemble]... the existing crossing at the SCE easement." WIL-4 stipulates that said crossing will be designed with input from CDFW, and will enhance movement of mule deer thorough the Project area.[116] [117] I was unable, however, to locate any reference to the efficacy of the existing crossing at the SCE easement. Thus, it is impossible to conclude that there would be any meaningful benefit in terms of the crossing's potential as a mitigation measure. In the absence of any substantiation that the crossing proposed in WIL-4 provides relief to deer moving through the area, it cannot be viewed as appropriate or adequate mitigation.

I9-151

Placing underground sections of the proposed pipelines in Basalt Canyon parallel to those in the existing pipeline is appropriate, as noted in WIL-5.[118] However, the statement that mule deer habitually use roads for movement is not supported by data included in the Draft EIS/EIR, because transects on which this statement is based were the roads themselves, and *investigators recorded tracks that crossed the roads*, not those running along the road (i.e., in the direction of travel the road provided).[119] [120] Information on deer crossing at buried sections of pipelines suggests that resident deer moved only sparingly across the pipelines at those points, as follows. "If all crossings of transects BB and EE in Basalt Canyon scrub are *assumed* [emphasis added] to represent deer that have crossed the existing (aboveground) Basalt Canyon pipeline, then on average 19 pipeline crossings per night occurred. Of these, an average 0.2 crossings per night utilized existing (underground) dips. The five dips "captured" 1% of crossings, which is roughly proportional to the 1% of pipeline length that dips underground (5 dips x 30 ft/dip)."[121] Mitigation based on the *assumption* that deer leaving tracks detected along transects crossed the pipeline is inappropriate in the absence of data to that effect. Additional

I9-152

[116] Draft EIS/EIR page 257.
[117] Draft EIS/EIR page 4.4-30.
[118] Draft EIS/EIR page 257.
[119] Paulus, J. 2011. Fall 2011 resident deer survey for the Casa Diablo, Basalt Canyon, and upper Basalt geothermal areas. 30 October 2011.
[120] Paulus, J. 2012. Fall 2011 migratory deer survey for the Casa Diablo, Basalt Canyon, and upper Basalt geothermal areas. 10 February 2012.
[121] Paulus, J. 2011. Fall 2011 resident deer survey for the Casa Diablo, Basalt Canyon, and upper Basalt geothermal areas. 30 October 2011.

studies that determine whether resident deer crossed under or over the pipeline at areas other than the "dips" are necessary before the proposed mitigation can be viewed as meaningful. Further, the mitigation proposed in WIL-5, that "Segments that are parallel to the existing Basalt Canyon pipeline in areas where there are currently no underground segments shall be installed underground at a prescribed frequency"[122] [123] contains no guarantee that the prescribed frequency will be meaningful in terms of providing for passage of mule deer. In the absence of a definition, the phrase "prescribed frequency" is open to interpretation and, thereby, worthy of question.

WIL-5 further states that, "These underground segments shall be located in alignment with suspected traditional migratory routes (see Figure 4.4-1)."[124] [125] There is no basis for selection of these proposed sites that has a foundation in the deer track survey data west of Highway 395, which indicate deer use is inconsistent in any particular part of the project area as determined from track data of resident deer.[126] Further, similar data are presented for the single year for which use by deer during the fall migration was assessed.[127] Unfortunately, a single year of such data, and absent information for the period of spring migration, fails to incorporate both annual and inter-annual variation that can be expected to occur.[128] The basis for selecting sites for the proposed underground segments thus, cannot be supported in the context of being "in alignment with suspected migratory routes" under conditions that will occur over an extended number of years. In fact, the investigations upon which site selection of the underground segments is based were conducted during unusually snow-free conditions.[129]

I9-152 cont.

WIL-5 clearly states that construction of underground segments in the existing Basalt Canyon pipeline is not proposed as mitigation, because deer readily pass over the single pipeline.[130] Evidence that deer readily pass over the single pipeline, however, is based on the *assumption* that tracks made by deer and detected on transects were made by animals that crossed the pipeline.[131] In the absence of data confirming that those deer actually crossed the existing pipeline, the efficacy of the proposed mitigation is speculative, with no assurance that any benefits would accrue.

In addition to the aforementioned underground segments, WIL-5 stipulates that overhead pipeline segments will be installed at high movement areas, and will be of sufficient

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[122] Draft EIS/EIR page 2-57.
[123] Draft EIS/EIR page 4.4-30.
[124] Draft EIS/EIR page 2-57.
[125] Draft EIS/EIR page 4.4-31.
[126] Paulus, J. 2011. Fall 2011 resident deer survey for the Casa Diablo, Basalt Canyon, and upper Basalt geothermal areas. 30 October 2011.
[127] Paulus, J. 2012. Fall 2011 migratory deer survey for the Casa Diablo, Basalt Canyon, and upper Basalt geothermal areas. 10 February 2012.
[128] Sawyer, H., M. J. Kaufmann, and R. M. Nielson. 2009. Influence of well pad activity on winter habitat selection patterns of mule deer. Journal of Wildlife Management 73:1052–1061.
[129] Paulus, J. 2012. Fall 2011 migratory deer survey for the Casa Diablo, Basalt Canyon, and upper Basalt geothermal areas. 10 February 2012.
[130] Draft EIS/EIR page 2-57.
[131] Paulus, J. 2011. Fall 2011 resident deer survey for the Casa Diablo, Basalt Canyon, and upper Basalt geothermal areas. 30 October 2011.

height above the substrate to allow "wildlife" to pass under the pipeline.[132] As pointed out earlier in this critique, the term wildlife refers to terrestrial vertebrates in general and, as written, WIL-5 fails to stipulate that these proposed crossings will be of a height adequate to allow mule deer to pass under them. The overhead pipeline segments must be installed at heights sufficient to allow mule deer, not just "wildlife," to pass under the pipeline.

I9-152 cont.

Monitoring of the effects of project implementation on mule deer movements is proposed in WIL-6.[133] [134] WIL-6 fails to incorporate performance measures and, therefore, reliance on it makes it impossible to determine just what will constitute an additional migration corridor needing remedial action. For example, if deer repeatedly approach the pipeline at a particular location and then turn away, will that constitute an additional migratory corridor that will initiate remedial action? As currently written such a result could be interpreted as not being evidence of a movement corridor. Further, the problematic nature of the methodology used previously — and that WIL-6 is to be modeled after — has been pointed out earlier in this letter. While the intended "remedial action" of installing earthen ramps over the pipeline proposed in WIL-6 is meritorious, it must be assured that adequate methods of sampling are employed, and that sampling covers a continuum of environmental conditions encountered during spring and fall migrations, as well as periods of presence of resident individuals. It is recommended that revised mitigation proposals include multiple years of sampling because of the variance associated with deer movements, and behavior is influenced by multiple factors, among which are local weather conditions.[135]

I9-153

"The Proposed Action would introduce new barriers to mule deer migration moving downslope from north to south to access meadow and riparian communities associated with Mammoth Creek. It is not known whether this would force some migrating deer further west and closer to U.S. Highway 395 where they would be subject to increased mortality due to vehicular collisions."[136] To mitigate the potential for the Proposed Action, there is acknowledgment that erecting any temporary barriers to movement that could redirect deer westward towards Highway 395 is an important consideration. It is then suggested that deer *could* move unimpeded to the east of the project area, and that an additional crossing provided south of the proposed plant site would reduce, but not eliminate the threat to migrating deer.[137] It is unclear, however, that the term "threat" to migrating deer is in reference to collisions between vehicles and deer on Highway 395, or to the pipeline itself. I concur that not erecting barriers that would force deer towards Highway 395 is important; however, there is no assurance that the proposed mitigation (i.e., the deer crossing) will lessen the probability of that happening. Further, if Alternative 2 is implemented the power plant will be shifted further east of Highway 395, but doing so will entail a substantial increase in the length of double pipelines, which

I9-154

[132] Draft EIS/EIR page 2-57.
[133] Draft EIS/EIR page 2-57.
[134] Draft EIS/EIR page 4.4-32.
[135] Sawyer, H., M. J. Kaufmann, and R. M. Nielson. 2009. Influence of well pad activity on winter habitat selection patterns of mule deer. Journal of Wildlife Management 73:1052–1061.
[136] Draft EIS/EIR page 4.4-17.
[137] Draft EIS/EIR page 4.4-17.

could further impede deer movement.[138] No performance measures are included for the proposed mitigation; therefore, no opportunity exists to assess its effectiveness.[139] If there is an increase in deer mortality as a result of vehicle collisions, meaningful action should include construction of a highway crossing and fencing appropriate to direct deer through or over that crossing, as has been successfully demonstrated elsewhere.[140]

I9-154 cont.

In conclusion, the Draft EIS/EIR fails to adequately identify and analyze the importance of the project site to mule deer and the resulting impacts to that species; this shortcoming occurs largely because the Draft EIR/EIS suffers from incomplete baseline information that would allow the reader to draw meaningful conclusions. Further, the Draft EIS/EIR fails to adequately identify and analyze the potential for the project to yield increased mortality among deer that would result from an increase in collisions with vehicles. The Draft EIS/EIR is not consistent with prior planning documents prepared by the Inyo National Forest and Mono County, all of which emphasize the importance of mule deer, protection of mule deer habitat, and protection of areas through which they move during migration. The Draft EIS/EIS further fails to adequately consider the cumulative impacts of the project on mule deer, particularly in the sense of population-level and ecosystem-level changes that will result if the Project causes mule deer to cease using the area that will be developed, are prevented from moving through the infrastructure created by the Project, or if the Project affects nutrient intake by the deer. Finally, the mitigation measures proposed to compensate for impacts to mule deer, mule deer habitat, and areas through which mule deer move during migration, are proposed in the absence of data adequate to ensure their efficacy. This problem exists largely as a result of the absence of data upon which to fully assess the potential impacts, as pointed out in the initial portion of my comments.

I9-155

Sincerely,

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Eastern Sierra Center for Applied Population Ecology

[138] Draft EIS/EIR page 2.77.
[139] Draft EIS/EIR page 2-57.
[140] Simpson, N. O. 2012. Use of vegetative overpasses by mule deer during migration. M.S. Thesis, University of Nevada, Reno, USA.

Comments

Of the
California Unions for Reliable Energy

On
Joint Draft Environmental Impact Statement / Environmental Impact Report for ORNI 50 LLC's Casa Diablo IV Geothermal Development Project

Mono County

Prepared and Submitted
to the
U.S. Bureau of Land Management and the
Great Basin Unified Air Pollution Control District

ATTACHMENT D

January 29, 2013

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JAN 30 2013
GREAT BASIN UNIFIED APCD

EXHIBIT D

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Re: Comments on Public Draft Joint Environmental Impact Statement and Environmental Impact Report for Casa Diablo IV Geothermal Development Project

To whom it may concern,

Per request by Pamela Epstein of Adams, Broadwell, Joseph & Cardozo, I have reviewed the Public Draft Joint Environmental Impact Statement and Environmental Impact Report ("Draft EIS/R") for the Casa Diablo IV Geothermal Development Project ("CD-IV Project" or "Project"), proposed by ORNI 50 LLC, a wholly-owned subsidiary of Ormat Nevada, Inc. ("Applicant"). The CD-IV Project would consist of constructing, operating, maintaining, and decommissioning a 33-Megawatt ("MW") net binary geothermal power generating facility and related infrastructure near Mammoth Lakes in Mono County, CA in the vicinity of the existing Mammoth Pacific L.P. geothermal complex located near the town of Mammoth Lakes in Mono County, California. The CD-IV Project would construct a new 33 net MW binary power plant, consisting of two Ormat Energy Converters ("OECs"); develop an expanded geothermal well field of up to 16 geothermal resource wells, construct pipelines to bring the geothermal brine to the

power plant and pipelines to take the cooled brine to injection wells, and install an electric transmission line to interconnect to a Southern California Edison substation.[1]

The Draft EIS/R for the CD-IV Project has been prepared in accordance with the National Environmental Policy Act, as amended ("NEPA"); the Federal Land Policy and Management Act; and the California Environmental Quality Act ("CEQA). The lead federal agency is the United States Department of the Interior, Bureau of Land Management ("BLM"), with the Department of Agriculture, Forest Service ("USFS") as a cooperating federal agency; the Great Basin Unified Air Pollution Control District ("GBUAPCD") is the lead agency under the California Environmental Quality Act ("CEQA").[2]

My review of the Draft EIS/R focuses on the CD-IV Project's potential impacts related to air quality and hazardous materials.

I. The Draft EIS/R Fails to Adequately Analyze and Mitigate Construction-Related Emissions

The Draft EIS/R finds that operation of diesel equipment during Project construction would result in emissions of nitrogen oxides ("NOx") in excess of the applicable CEQA significance threshold for maximum daily emissions, indicating that Project construction could cause or contribute to an exceedance of the state 1-hour or 8-hour ambient air quality standard for ozone.[3,4] The Draft EIS/R finds that implementation of Mitigation Measure AQ-1 would reduce NOx emissions associated with mobile off-road equipment; however, total mitigated maximum daily emissions would still exceed the applicable CEQA significance threshold and therefore construction-related NOx emissions are considered to result in significant and unavoidable impacts on air quality, both individually.[5] The Draft EIR finds that construction-related emissions of reactive organic gases ("ROG") and particulate matter

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[1] Draft EIS/R, p. ES-2.

[2] United States Department of the Interior, Bureau of Land Management, and United States Department of Agriculture Forest Service, and Great Basin Unified Air Pollution Control District, Public Draft Joint Environmental Impact Statement and Environmental Impact Report for the Casa Diablo IV Geothermal Development Project, November 2012, DOI Control #: DES 12-21, Publication Index #: BLM/CA-ES-2013-002+1793, State Clearinghouse No. 2011041008.

[3] Draft EIS/R, p. 4.2-14.

[4] Nitrogen oxides (as well as reactive organic gases) are ozone precursors.

[5] Draft EIS/R, p. 4.2-14.

equal to or smaller than 10 micrometers ("PM10") and 2.5 micrometers ("PM2.5") would be below the applicable CEQA thresholds for maximum daily emissions and are therefore considered to be less than significant.[6] As discussed in the comments below, the Draft EIS/R may have underestimated construction-related emissions of all pollutants and fails to require adequate mitigation for the significant NOx emissions. I9-156

I.A Maximum Daily Combustion Exhaust Emissions from Drill Rigs during Well Construction Are Not Adequately Supported and May Be Underestimated

Maximum daily emissions from combustion exhaust during construction are primarily related to well drilling activities, mostly from the diesel-powered engines on drill rigs.[7] These emissions are unsupported and may be underestimated. I9-157

Horsepower and Hours of Operation

The Draft EIS/R estimates maximum daily emissions from drill rig engines assuming that three 1,354 brake horsepower ("bhp") drill rigs (Units #1-3) each operate 10 hours per day and one 197-bhp drill rig (Unit #4) operates 2 hours per day.[8] These assumptions appear to conflict with information provided elsewhere in the Draft EIS/R, which indicates that based on actual fuel use data during recent well drillings obtained from Ormat, it is assumed that well development would require two large drill rigs each including approximately four engines with a combined engine rating of over 4,250 bhp per drill rig and operating a combined total of 16 hours per drill rig.[9] The Draft EIS/R should be revised to provide consistent information, and, if indicated, emission calculations should be revised to reflect actual equipment usage. I9-158

Registration with California Air Resources Board's Portable Equipment Registration Program

Further, the Draft EIS/R calculates worst-case emissions from drill rigs assuming that the engines would meet U.S. Environmental Protection Agency ("USEPA") and California Air Resources Board ("CARB") Tier 2 emission standards for diesel-powered off-road engines: I9-159

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[6] *Ibid.*

[7] Draft EIS/R, p. 4.2-9.

[8] Draft EIS/R, Appx. C, p. C-7.

[9] Draft EIS/R, p. 4.2-2.

> Because the drill rigs would be registered with CARB's Statewide Portable Equipment Registration Program, it is expected that the drill rig engines would meet USEPA and CARB Tier 2 standards for off-road engines. Therefore, the Tier 2 grams/brake horsepower-hour (g/bhp-hr) emission standards obtained from CARB and SCAQMD for ROG, NOx, CO, and PM10 were used as worst case emission rates for the drill rigs.[10]

However, CARB's Statewide Portable Equipment Registration Program ("PERP"), is a voluntary program that allows owners or operators of portable engines and certain other types of equipment to register their units in order to operate their equipment throughout California without having to obtain individual permits from local air districts. Registration does not guarantee that drill rig engines used for Project construction would comply with Tier 2 emission standards; the drill rig engines could have been registered with PERP before December 31, 2009 and their registration renewed in which case the engines only have to comply with Tier 1 emissions standards, which are considerably higher.[11,12] Thus, absent a specific mitigation measure requiring that drill rig engines used for Project well drilling would comply with USEPA/CARB Tier 2 standards, there is no guarantee that they in fact would, and, thus, emissions from drill rigs may be underestimated.

I9-159 cont.

The Draft EIS/R should be revised to adequately discuss, support, and, if necessary, revise its emission estimates for drill rigs.

I.B Additional Feasible Mitigation for NOx Emissions from Drill Rigs Exists and Should Be Required

NEPA requires the evaluation of all feasible mitigation measures which would avoid and or lessen a significant impact. Similarly, CEQA requires implementation of all feasible mitigation measures to reduce significant impacts. Here, the Draft EIS/R states that no further feasible NOx emission control technology is feasible for the drill rigs because the engines would comply with USEPA/CARB Tier 2 emission standards for off-road equipment. As discussed above, the assumption that drill rig engines would comply with Tier 2 standards is not supported. Further, the Draft EIS/R fails to discuss why compliance Tier 3 or the current Tier 4 standards is not considered feasible

I9-160

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[10] *Ibid.*

[11] *See* CARB, Statewide Portable Equipment Registration Program (PERP); http://www.arb.ca.gov/portable/portable.htm; and Off-Road Compression-Ignition (Diesel) Engine Tiers; http://www.arb.ca.gov/portable/perp/tiers_1-21-10.pdf.

[12] Tier 0 engines are no longer eligible for registration with PERP; *see* California Air Resources Board, PERP 2011 Regulation Changes; http://www.arb.ca.gov/portable/perp/perpchanges.pdf.

mitigation. Further, retrofitting existing equipment with a selective catalytic reduction system ("SCR") may be a feasible option for older equipment. Retrofit of SCR systems on drill rig engines has been found feasible and is offered by several manufacturers[13,14] and has been successfully implemented elsewhere. For example, Shell Exploration & Production Co. has equipped some of its natural gas drill rigs operating in Wyoming with SCR systems.[15] The manufacturer states that because of the modular design of the system, it is easy to transport and reassemble at a new drilling location with minimal effort.[16] The BLM considered retrofitting drill rigs with SCR systems as a potential mitigation measure, *e.g.*, to reduce NOx emissions for the Casper Resource Management Plan.[17]

I9-160 cont.

The Draft EIR should be revised to provide an adequate discussion of all feasible mitigation to reduce the significant construction-related NOx emissions to the maximum extent feasible and require more stringent mitigation measures such as engine certification to higher than Tier 2 and/or retrofit of drill rig engines with SCR systems.

I.C Mitigation Measure AQ-1 for NOx Emissions from Off-road Mobile Equipment Should Be Amended to Strengthen Its Language

The Draft EIS/R requires implementation of Mitigation Measure AQ-1 to reduce NOx emissions from off-road mobile equipment:

> ORNI 50, LLC shall develop and implement a plan that demonstrates that the mobile off-road equipment (more than 50 horsepower) to be used in the Proposed Action (*i.e.*, owned, leased, and subcontractor vehicles) would achieve a Project wide fleet-average 20 percent NOx reduction compared to the most recent CARB fleet average. The plan shall be approved by GBUAPCD prior to the commencement of construction activities. Acceptable options for reducing emissions include the use of late model

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[13] *For example*, Johnson Matthey, Inc., Case No. 801: Controlling NOx from Gas Drilling Rig Engines with Johnson Matthey's Urea SCR System, 2008; http://www.jmsec.com/Library/Fact-Sheets/801-Shell_Gas_Drill_Rig.pdf.

[14] *For example*, Miratech http://www.miratechcorp.com/site/miratech/section/21;

[15] Dawn M. Geske, Wyoming Becomes Home to Cleaner Drilling, *Diesel Progress*, North American Edition, November 2008; http://jmsec.com/Library/Articles/DPNA920-2.pdf.

[16] *Ibid.*

[17] BLM, Proposed Resource Management Plan and Final Environmental Impact Statement for the Casper Field Office Planning Area, June 2007, Appendix L, Air Quality Mitigation Matrix; http://www.blm.gov/wy/st/en/programs/Planning/rmps/casper/feis_prmp.html.

engines, low-emission diesel products, alternative fuels, engine retrofit technology, after-treatment products, and/or other options as they become available.[18]

This mitigation measure is feasible and, in similar form, is routinely required by other agencies. However, I suggest amending Mitigation Measure AQ-1 as follows to strengthen its language:

- The CARB's *Fleet Average Calculators*[19] can be used to identify an equipment fleet that achieves this reduction.
- The Project representative shall submit to the GBUAPCD a comprehensive inventory of all off-road construction equipment, equal to or greater than 50 horsepower, that will be used an aggregate of 40 or more hours during any portion of the construction project. The inventory shall include the horsepower rating, engine model year, and projected hours of use for each piece of equipment. The inventory shall be updated and submitted monthly throughout the duration of the project, except that an inventory shall not be required for any 30-day period in which no construction activity occurs. At least 48 hours prior to the use of subject heavy-duty off-road equipment, the project representative shall provide the GBUAPCD with the anticipated construction timeline including start date, and name and phone number of the project manager and on-site foreman.

I9-161

II. Hydrogen Sulfide Emissions from Well Drilling May Result in Significant Odor Impacts and/or Unhealthful Concentrations in Ambient Air

The Draft EIS/R recognizes that releases of hydrogen sulfide ("H_2S") could occur during well drilling and construction yet it does not provide a quantitative analysis of potential H_2S releases during construction of the CD-IV Project's wells, instead stating that "given the temporary nature of construction activities and the lack of long-term emissions, health risks are assessed qualitatively."[20] The Draft EIS/R provides the following discussion of potential public health risks and odor during construction of the CD-IV Project:

I9-162

> During well cleanout and flow testing, geothermal fluids would likely be pumped into large open containers. H_2S may temporarily be released from the geothermal fluid for several hours during these activities. The local H_2S emissions during these activities could exceed the GBUAPCD H_2S emissions standard of 2.5 kg/hr/source and could

[18] Draft EIS/R, p. 4.2-20.

[19] CARB, Fleet Average Calculators; http://www.arb.ca.gov/msprog/ordiesel/documents/documents.htm.

[20] Draft EIS/R, p. 4.2-4.

> produce an objectionable "rotten egg" odor in the immediate vicinity of each well. However, these concentrations would not be expected to pose a health hazard and would not reach far beyond the vicinity of the well under normal conditions. Potential H_2S emissions resulting from these activities would be temporary at each well development site and would occur for a relatively short period of several hours.[21]

This terse discussion is not adequate to assess potential public health risks and odor impacts that could occur due to H_2S emissions from construction of the Project's wells and its conclusions are unsupported.

Health Effects of Hydrogen Sulfide

Hydrogen sulfide, which has the characteristic odor of rotten eggs, is an irritant and can be poisonous at high concentrations. Health effects range from nose, throat and lung irritation, digestive upset and loss of appetite, headache, and dizziness to sudden collapse, unconsciousness, and death depending on its concentrations. The U.S. Department of Health and Human Services summarizes health effects of exposure to H_2S as follows:

I9-162 cont.

> Exposure to low concentrations of hydrogen sulfide may cause irritation to the eyes, nose, or throat. It may also cause difficulty in breathing for some asthmatics. Brief exposures to high concentrations of hydrogen sulfide (greater than 500 ppm) can cause a loss of consciousness. In most cases, the person appears to regain consciousness without any other effects. However, in some individuals, there may be permanent or long-term effects such as headaches, poor attention span, poor memory, and poor motor function. … Deaths due to breathing in large amounts of hydrogen sulfide have been reported in a variety of different work settings, including sewers, animal processing plants, waste dumps, sludge plants, oil and gas well drilling sites, and tanks and cesspools.[22]

The Draft EIS/R fails to provide any discussion of odor thresholds or potential health effects at various levels of exposure to H_2S. In parts per million ("ppm"), these can be approximated as follows:

I9-163

0.001–0.13 ppm	odor threshold (highly variable)
1–5 ppm	moderately offensive odor, possibly with nausea, or headaches with prolonged exposure
20–50 ppm	nose, throat and lung irritation, digestive upset and loss of appetite, sense of

[21] Draft EIS/R, p. 4.2-10.

[22] U.S. Department of Health and Human Services, Agency for Toxic Substances and Disease Registry, *Toxicological Profile for Hydrogen Sulfide*, July 2006, p. 4; http://www.atsdr.cdc.gov/toxprofiles/tp114.pdf

	smell starts to become "fatigued," odor cannot be relied upon as a warning of exposure
100–200 ppm	severe nose, throat and lung irritation, ability to smell odor completely disappears
250–500 ppm	potentially fatal build-up of fluid in the lungs (pulmonary edema) in the absence of central nervous system effects (headache, nausea, dizziness), especially if exposure is prolonged
500 ppm	severe lung irritation, excitement, headache, dizziness, staggering, sudden collapse ("knockdown"), unconsciousness and death within 4-8 hours, loss of memory for period of exposure
500–1000 ppm	respiratory paralysis, irregular heartbeat, collapse, and death; it is important to note that the symptoms of pulmonary edema, such as chest pain and shortness of breath, can be delayed for up to 48 hours after exposure.[23]

I9-163 cont.

To put these numbers in perspective, 1 ppm H_2S equals 1.5 milligrams per cubic meter ("mg/m^3") or 1,500 micrograms per cubic meter ("µg/m^3") in air. In comparison, the Draft EIS/R states that well cleanout and testing could result in H_2S releases in excess of 2.5 kilograms (2,500,000 milligrams or 2,500,000,000 micrograms) per hour.[24] When hydrogen sulfide is released as a gas, it remains in the atmosphere for an average of 18 hours.[25] Thus, large quantities of H_2S could accumulate in the vicinity of and disperse from the well site and present an odor nuisance as well as a public health hazard to nearby receptors. Because exposure to H_2S can result in both acute and chronic health effects, the cited "temporary" nature of construction activities is no excuse for an adequate assessment, especially given the potential of cumulative impacts from other planned (*e.g.*, Mammoth Pacific I Replacement Project) and existing geothermal developments in the area.

Proximity and Potential Exposure of Public to Hydrogen Sulfide Releases

As shown in the inset map (excerpted from the Draft EIS/R) below, several recreational areas are within a mile of the proposed Project geothermal well locations: the New Shady Rest Campground, the Pine Glen Campground and the Shady Rest Park; the latter is located within less than 0.5 miles of six new well sites (Nos. 15-25, 25-25, 34-25, 52-25, 50-25, and 38-25 and three existing well sites (Nos. 14-25, 12-25,

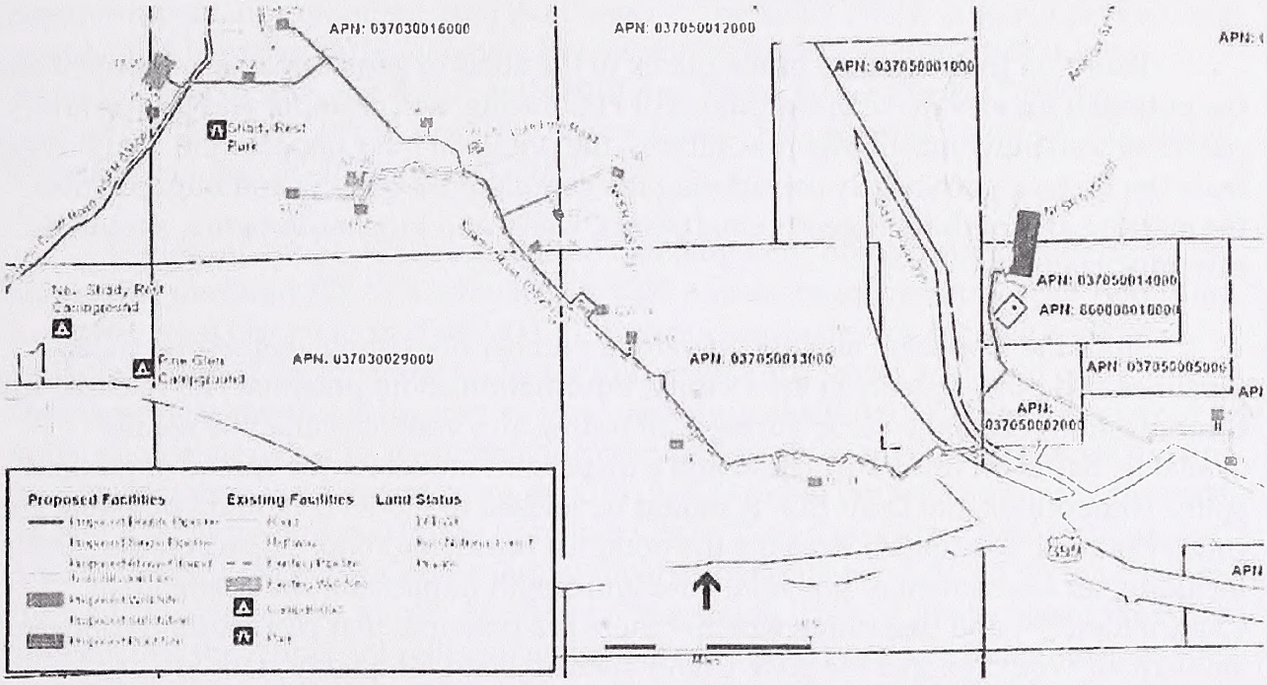
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[23] Organisation for Economic Co-operation and Development, WGCA Steering Group of Analysis of H_2S Incidents, *Analysis of H_2S- Incidents in Geothermal and Other Industries*, Preliminary Analysis of Data, p. 7; http://www.vinnueftirlit.is/vinnueftirlit/upload/files/skyrslur/oecd_analysis_of_h2s-incidents.pdf.

[24] Draft EIS/R, p. 4.2-10.

[25] *Toxicological Profile for Hydrogen Sulfide*, p. 2.

and 57-25). Publicly accessible trails and roads traverse the area where geothermal wells and pipelines are proposed or already exist.



According to the Draft EIS/R, drilling and development of the up to 16 Project wells would occur for about six months per year over the two-year construction period with a total of two wells being constructed simultaneously. These activities would occur during non-winter months, *i.e.*, June through November[26], and would, thus, coincide with the period when the nearby recreational areas likely have the highest occupancy rates and the public would use trails and roads in proximity to the wells and pipelines. The public could be exposed to elevated concentrations of H_2S released during well cleanout and testing as well as a result of spills, pipeline ruptures or uncontrolled releases from the wells ("well blowouts")[27], a well-recognized risk for the geothermal industry.[28]

As summarized above, the odor threshold for H_2S in air is very low (less than one ppm) and subtle to distinct physiological effects can be detected at just slightly higher concentrations (≤ 50 ppm). Serious health effects occur over concentrations of

I9-164

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[26] Draft EIS/R, p. 2-35.

[27] Draft EIS/R, pp. 4.2-10 and 4.4-8.

[28] *See, e.g., Analysis of H_2S- Incidents in Geothermal and Other Industries.*

only 50 ppm. Because hydrogen sulfide is heavier than air and because children are shorter than adults, children may be exposed to more hydrogen sulfide than adults could be exposed to higher health risks.[29]

Based on the proximity of the public to the areas of geothermal development and the potential for elevated concentrations of H_2S during well cleanout and testing and potential well blowouts or pipeline failures, the potential odor impacts and health risks from the Project, particularly considering the cumulative exposure and impacts from the existing and permitted geothermal plants, wells, and pipeline network, should be carefully evaluated.

I9-164 cont.

Since the Applicant already operates a number of existing geothermal wells, pipelines and power plants in the vicinity, information about potential H_2S releases and concentrations that may occur during well testing and venting should be readily available. Based on this information and a dispersion model for the spread of gaseous sulfur compounds, the Draft EIS/R should be revised to model maximum potential H_2S concentrations, adequately evaluate the potential health and odor impact on the public including an assessment of potential odor and health impacts for the residence at Chance Ranch[30], and determine whether there is a potential that H_2S concentrations in ambient air would exceed the state 1-hour state ambient air quality standard of 42 $\mu g/m^3$. If indicated by the results of this assessment, the Draft EIS/R should require as a mitigation measure that trails and recreation areas are closed to the public during well drilling and development in order to avoid exposure to unhealthful concentrations of H_2S in the air.

I9-165

III. The Draft EIS/R's Analysis of Reactive Organic Gas Emissions from the Project's Motive Fluid System Is Deficient

According to the Draft EIS/R, Project operation and maintenance would result in emissions of more than 400 lb/day of ROG, by far in excess of the applicable CEQA threshold of 75 lb/day. These ROG emissions are almost exclusively related to fugitive emissions of the motive fluid, n-pentane, at the binary power plant.[31] Reactive organic gases are ozone precursors for which the area has been designated as being in non-attainment with the state 1-hour and 8-hour ozone standards.[32]

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[29] *Toxicological Profile for Hydrogen Sulfide*, p. 5.

[30] *See* Draft EIS/R, p. 3.2-5.

[31] Draft EIS/R, Table 4.2-4, p. 4.2-12.

[32] Draft EIS/R, p. 4.2-6.

III.A Emission Estimates Are Not Adequately Supported

The Draft EIS/R presents an estimate of 410.0 lb/day and 74.8 ton/year ROG for fugitive n-pentane emissions from the Project.[33] The Draft EIS/R does not provide any calculations to arrive at this estimate but instead refers to a document that is not provided, specifically, the Applicant's 2010 *Application for Geothermal Drilling, Commercial Use, Site License, and Construction Permit, Plan of Development (POD), Plan of Operation and Plan of Utilization (POU).*[34]

Review of application materials obtained by your office from the GBUAPCD[35] shows that the Draft EIS/R's estimates of ROG emissions are unsupported. According to a letter from Ormat to the GBUAPCD, emission estimates for fugitive n-pentane emissions from "OEC operational losses (fill, drain, tube leaks) are based on "engineering estimates using motive fluid inventory at similar facilities." Review of the application materials and accompanying calculations show that the Applicant did not provide a motive fluid inventory to the GBUAPCD either but instead simply presents an estimate for operational losses from two OECs "Based on Ormat O&M experience" for a "Typical 36 MW Air Cooled Ormat Binary Power Plant".[36] Based on information from CEQA documents for the Applicant's Mammoth Pacific I Replacement Project, it appears that the Applicant relies on emissions of 92 lb/day or 1.73 kilograms per hour per OEC.[37] There, the information was provided for a "Typical 16 MW Air-Cooled OEC," also without any further documentation. As such, the emission estimates are not adequately supported. While the Applicant may have carefully evaluated potential emissions and provided engineering estimates based on best engineering judgment, mere hearsay without adequate documentation and evidence in the record which leaves the reviewer with the only option to accept the presented emissions at face value, is not adequate for purposes of CEQA or NEPA review.

I9-166

Further, neither maximum daily nor total annual emissions of n-pentane are proposed to be monitored in any way and, thus, no verification of the Applicant-

I9-167

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[33] Draft EIS/R, Tables 4.2-4 and 4.2-5, p. 4.2-12.

[34] *See* Footnotes b to Draft EIS/R, Tables 4.2-4 and 4.2-5, p. 4.2-12, and Reference Section, p. 10-25.

[35] Letter from Ron Leiken, Ormat Nevada, to Duane Ono, Deputy Air Pollution Control Officer, GBUAPCD, Re: Application for Authority to Construct for the CD-4, ORNI 50, LLC, Geothermal Power Plant Development Project, May 24, 2012.

[36] *Ibid*, Attachment "Typical 36MW Air Cooled Ormat Binary Power Plant, Emission calc" dated May 1, 2012.

[37] County of Mono, Mammoth Pacific I Replacement Project, Final Environmental Impact Report, California Clearinghouse Number 2011022020, September 2012, Response to Comment 9D-04, p. 39.

supplied values would ever occur. This undermines the very intent of the CEQA and NEPA review process to adequately disclose air pollutant emissions and associated impacts on air quality in the first place. Further, because binary geothermal plants are a relatively new technology, care should be taken to establish appropriate emission rates in order to avoid perpetuating unsupported and potentially erroneous assumptions during the environmental review for similar projects in the future.

I9-167 cont.

To verify the Applicant's emission estimates, the Draft EIS/R should be revised to provide purchase inventory records for other similar facilities and accompanying emission calculations or, alternatively, require that an annual n-pentane purchase inventory be submitted to the GBUAPCD and compared to the emission estimates presented in the Draft EIS/R and application to the GBUAPCD.

I9-168

III.B The Draft EIS/R Fails to Require Best Available Control Technology for Operational Emissions of Reactive Organic Gases

The estimated ROG emissions from operation of the Project are almost exclusively related to fugitive emissions of the motive fluid, n-pentane, at the binary power plant. The Draft EIS/R claims that because the Project "is proposed to include state of the art equipment and best available technology that would limit fugitive ROG (*i.e.*, n-pentane) emissions, *no additional feasible mitigation measures are available* to further substantially reduce fugitive ROG emissions, and the CD-IV Project would result in a significant and unavoidable impact related to long-term fugitive emissions of n-pentane."[38] The statement that no additional feasible mitigation measures are available is incorrect.

I9-169

The Applicant's Best Available Control Technology ("BACT") analysis, submitted to the GBUAPCD with the Application for an Authority to Construct ("ATC") for the Project[39], proposes implementation of the following concepts and technologies:

- Reducing the number of valves, flanges, and other connections compared to the first generation plants such as G-1, G-2, and G-3.
- Installation of vapor recovery devices estimated to return at least 99% of the motive fluid back to the system.

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[38] Draft EIS/R, p. 4.2-11, *emphasis* added.

[39] Letter from Ron Leiken, Ormat Nevada, to Duane Ono, Deputy Air Pollution Control Officer, GBUAPCD, Re: Application for Authority to Construct for the CD-4, ORNI 50, LLC, Geothermal Power Plant Development Project, May 24, 2012.

- Use of a maintenance vapor recovery unit during OEC unit maintenance activities to capture motive fluid that could otherwise be released.
- Lower pressure of motive fluid system compared to motive fluid used at older existing plants, thus, less potential for fugitive leaks/emissions.
- Placement of pentane-specific vapor sensors and flame detectors at strategic locations around the around the turbine, motive fluid pumps, and motive fluid storage tank and connection to power plant computer control system to quickly alert plant operators to any potentially hazardous situations, which would help to keep a check on significant leaks.
- Leak checks, inspections, monitoring, and leak logging.

Leakless Technology for Motive Fluid System

An additional technology available to reduce fugitive emissions of n-pentane from equipment leaks is the use of leakless technology for the Project's motive fluid system. Pipes, valves, pumps and other equipment are commonly connected using flanges that are welded or screwed. Here, it appears that the Applicant proposes to use screwed, or threaded, flanges.[40] Threaded flanges leak, no matter how carefully executed; welded connections on the other hand do not (unless defective) and, thus, eliminate 100% of the emissions. Thus, reducing the number of valves, flanges and connectors, while undoubtedly effective, as proposed, is only the first step in reducing fugitive equipment leaks. Instead, BACT for the Project's motive fluid system is the use of leakless equipment components, a technology that is routinely required for construction of new or modification of existing refineries and chemical facilities and equally feasible here. The Draft EIS/EIR should be revised to require the use of leakless components for all equipment components that could result in fugitive leaks of the motive fluid n-pentane. Further Project Design Measure AQ-3 should be revised to specifically refer to "BACT as required by GBUAPCD Rule 209-A, Section D (for new stationary sources of emissions which would result in a net increase in emissions of 250 or more lb/day of any air pollutant or precursor except for CO and particulate matter)" instead of "best available equipment and design" for which no legal definition exists.

I9-170

[40] *Ibid*, Attachment "Typical 36MW Air Cooled Ormat Binary Power Plant, Emission calc" dated May 1, 2012: "Flanges, Connetors [sic], Screwed."

Vapor Recovery Unit Control Efficiency

The Applicant proposes a 99% control efficiency as BACT for the vapor recovery devices. Yet, the Draft EIR states that "other facilities similar to what is proposed for the CD-IV Project have demonstrated better than 99.6 percent efficiency in controlling and recovering n-pentane emissions *during normal operations.*"[41] Thus, it appears that BACT, as demonstrated in practice, is 99.6% rather than 99% control efficiency. The Draft EIR (and the ATC Application to the GBUAPCD) should provide a top-down analysis of control efficiency for vapor recovery devices and revise the BACT determination accordingly. I9-171

Leak Detection and Repair Program

The Applicant's proposed BACT measures for equipment leaks include the "placement of pentane-specific vapor sensors at strategic locations" as well as "leak checks, inspections, monitoring, and leak logging." While the proposed measures may prevent help prevent significant leaks, they are not adequate to address smaller and slow leaks and do not constitute BACT for the Project. The USEPA has developed leak detection and repair ("LDAR") regulations for petroleum refineries and chemical manufacturing facilities. Implementation of an LDAR program is equally feasible for the Project's motive fluid system. LDAR incorporates the elements of the proposed inspection program but goes further. For example it requires quantification of fugitive ROG leaks with a portable analyzer (per USEPA Reference Method 21). The Draft EIR should be revised to require as a mitigation measure the use of LDAR following USEPA's *Best Practices Guide*[42]. I9-172

IV. The Draft EIS/R Fails to Provide an Off-Site Consequence Analysis for Transportation of the Flammable Motive Fluid n-Pentane to the Site

The motive fluid that would be used at the CD-IV Project, n-pentane, is a highly flammable liquid at standard temperature and pressure which is typically transported and stored under pressure.[43] The Draft EIS/R recognizes that the use of n-pentane requires a risk management plan ("RMP") due to the potential risk of explosion and fire and acknowledges that transportation of n-pentane "could indirectly result in an I9-173

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[41] Draft EIS/R, p. 4.2-12, *emphasis* added.

[42] USEPA, Leak Detection and Repair Compliance Assistance Guidance, A Best Practices Guide; http://www.epa.gov/compliance/resources/publications/assistance/ldarguide.pdf.

[43] Draft EIS/R, p. 4.13-6.

incremental increase in the potential for accidents"[44] but fails to provide an off-site consequence analysis for transportation of the hazardous substance to the site as required by the Chemical Accident Prevention Provisions under USEPA's RMP rule (Section 112(r) of the federal Clean Air Act).[45] Instead, the Draft EIS/R only states that Applicant "would update its existing RMP and incorporate the CD-IV facility into its Process Safety Program Safety Management Program".[46] This approach improperly defers an analysis into the future that should be part of the CEQA/NEPA review process for the Project and is therefore not permissible. I9-173 cont.

The Draft EIS/R should be revised to provide an off-site consequence analysis for the flammable motive fluid n-pentane using USEPA's RMP*Comp model as required by the USEPA's RMP to satisfy the requirements of CEQA and disclose all potential impacts to the public. This analysis should include potential cumulative risks from other planned and existing geothermal facilities in the vicinity.

V. Recommendation

I recommend that the lead agencies prepare a revised Draft EIS/R for review and comment by the public that addresses the above discussed issues. I9-174

Please feel free to call me at (415) 492-2131 or e-mail at petra.pless@gmail.com if you have any questions.

With best regards,

Petra Pless, D.Env.

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[44] Draft EIS/R, p. 4.13-7.

[45] U.S. Environmental Protection Agency, Risk Management Plan (RMP) Rule; http://epa.gov/emergencies/content/rmp/index.htm.

[46] Draft EIS/R, p. 4.13-7.

MLTPA
MAMMOTH LAKES TRAILS · PUBLIC ACCESS

January 30, 2013

Collin Reinhardt
Bureau of Land Management
Bishop Field Office
351 Pacu Lane, Suite 100
Bishop, CA 93514

Re: Casa Diablo IV Geothermal Development Project draft EIR/EIS

Dear Mr. Reinhardt:

Thank you for the opportunity to review the Joint Draft Environmental Impact Statement/Environmental Impact Report (EIS/EIR) for the Casa Diablo IV Geothermal Development Project. The Mammoth Lakes Trails and Public Access Foundation (MLTPA) provides the following comments on the Draft EIS/EIR.

Please note the following as you review our comments:

1. Most of our comments tier from comments originally submitted by the Town of Mammoth Lakes (TOML). Each original TOML comment is presented in italics, with the original ID for the Town's comment highlighted in grey. The Towns' original comments are not numbered.
2. MLTPA comments are highlighted in yellow and are preceded by a cumulative number that is specific to each topic of concern ("Air Quality", "Land Use", "Recreation", etc".)
3. These comments were developed with members of "Mammoth Trails", a confederation of user groups here in Mammoth Lakes, and other members of the community. Those user groups and individuals in support of these comments have signed this letter along with MLTPA.

Thanks again for your time and consideration as you review these comments.

A. Project Description and Affected Environment

Town of Mammoth Lakes Comment: A1 *"Chapter 2 of the EIS/EIR provides a description of the proposed project, including detailed information on potential power plant, wells, and pipelines to be constructed. The project description notes that new pipelines would be installed, which in some cases would parallel the existing pipeline. However, the project description is inadequate because it fails to describe the total number of pipes and cumulative width of pipelines that would ultimately be in place - in some instances this could be three or even four pipelines wide. The Town is*

concerned that this omission tends to understate the impacts of these wide barriers to recreationists, to wildlife, and on visual resources. The project description should be revised to fully describe and map the total number and width of all pipelines considering both existing and new pipes that would be installed with the project. The impact analysis throughout the document should be similarly revised to properly account for the impact of the total pipeline width."

1. MLTPA Comment - Project Description and Affected Environment: "Town of Mammoth Lakes Comment: A1" This is an important comment that we support. The project description is also inadequate because it fails to describe the phasing of the pipeline construction program and how the various stages of construction will be communicated to the recreating public. **I10-1**

Town of Mammoth Lakes Comment: A2 *"Throughout Chapter 2 and 3 the document incorrectly indicates that Mono County maintains several roads including Sawmill Cutoff Road and Sawmill Road. Please clarify since Town records do not show the County maintaining any roads within the municipal boundary. The Town of Mammoth Lakes does maintain Sawmill Cutoff Road from SR203 to the end of the asphalt pavement near Shady Rest Park (O3S308). The Town also maintains Shady Rest Park access road (03S08N and 03S08P).*

2. MLTPA Comment - Project Description and Affected Environment: Town of Mammoth Lakes Comment: A2" This is an important comment that we support. As the project anticipates an ambitious plowing, grooming and maintenance program of roads during both winter and summer seasons, it is important that existing maintenance responsibilities for all existing infrastructure be clearly identified prior to any construction or mitigation efforts. There is a documented history of confusion with regards to maintenance of roads in the region. Sherwin Creek Road is an appropriate exampled. In order to mitigate the effects of the project on existing roads, in both winter and summer, ownership and maintenance confusion must be resolved so that responsible parties can be identified and maintenance and mitigation responsibilities assigned. **I10-2**

3. MLTPA Comment - Project Description and Affected Environment: Chapter 3 (section 3.14.2) of the EIR/EIS should cite the "Inyo National Forest Shady Rest Motorized Staging Project" as germane to the project's "Applicable Regulations, Plans, and Policies /Management Goals". As quoted from the Town's "Trail System Master Plan": "The Inyo National Forest received an OHV grant from the State of California to support recreation planning efforts for the "Shady Rest" area within the Town of Mammoth Lakes. The planning process is designed to address year round motorized use while considering the needs of non-motorized users in the immediate and surrounding area and the potential impact of proposed geothermal development. The desired outcome of the planning process is to design, review, and approve the development of a new year-round motorized staging area." **I10-3**

4. MLTPA Comment - Project Description and Affected Environment: Chapter 3 (section 3.14.2) of the EIR/EIS identifies the "Mammoth Lakes Trail System Master Plan (2009)" as germane to the project's "Applicable Regulations, Plans, and Policies /Management Goals". The EIR/EIS should reflect the following with regards to the Mammoth Lakes Trail System Master Plan (TSMP). **I10-4**
    a. The TSMP was finalized and adopted by the Town in 2011. **I10-5**
    b. Chapter 3 of the TSMP - "Needs Analysis" – contains 35 + references to "Shady Rest" via a PDF search. Most of the references associate "Shady Rest" to popular recreation activities. As the EIR/EIS did not conduct an analysis of recreation activities in the project area, this information may be helpful. It should not, however, be used as a substitute for the full analysis of recreation activities and usage that should be conducted by the EIR/EIS. **I10-6**
    c. Chapter 4 of the TSMP – "Future Trail System Recommendations" – recommends the following projects in the Shady Rest area:
        i. "Recommendation N5: Summer Recreation Nodes: Shady Rest Park: Bus and Signage (Future Amenities)" - Table 4-2
        ii. "Recommendation N6: Winter Recreation Nodes: Shady Rest / Saw Mill Cutoff Road + Shady Rest Park: Restroom, Bus, Signage (Future Amenities) – Table 4-3
            1. "At Shady Rest / Saw Mill Cutoff Road, restrooms should be open and maintained in the winter. Additional options for modifications in the Shady Rest area can be found in the Winter Trails discussion at the end of this chapter."
        ii. "Recommendation MUP4: Multi-Use Paths Outside the UGB"
            1. "The **Shady Park Path Extension** follows an alignment that more closely resembles the original alignment from the 1991 Trail System Plan. The modified route would travel from the current terminus of the paved path and follow the tree line, traveling just north of the proposed staging area at GIC 67, and then turning west to connect back to the Welcome Center for a complete loop. In addition, this new trail would form the proposed modified OSV closure boundary in winter and provide a key loop for the Shady Rest Nordic system." **I10-7**
            2. "The **Forest Trail to Shady Rest Campground Connector** was also identified in the 1991 Trail System Plan. It will improve trail access to Shady Rest for the residents living north of Main Street and provide access for a future Knolls/Overlook Trail."
            3. "A **Knolls Path (south route)** has been recommended between the Shady Rest Path at Sawmill Cutoff Road and the Community Center Park. The alignment runs just outside the UGB to the north of Forest Trail and around

the Knolls neighborhood before connecting into the Community Center parking lot. Identifying the alignment with the most suitable grades will be an important element in the design of this project."

iii. Chapter 7 of the TSMP – "Operations and Maintenance" – provides recommendations for "Winter (Snow) Maintenance" including "Snow Removal or Clearing", "Grooming", and "No Snow Maintenance".

iv. Chapter 7 of the TSMP – "Operations and Maintenance" – provides the following recommendation for winter grooming:

1. "Recommendation M4: Prioritization of Winter Grooming along Individual Paved Path (MUP) Segments: Path Name = Forest Trail to Shady Rest Connector; From = Forest Trail; To = Sawmill Cutoff Road; Notes = Provides over-snow connection between Shady Rest and residences to the west." - Table 7-6

I10-7 cont'd

b. Maps

i. Maps in the EIR/EIS are inadequate due to their failure to include existing recreation facilities in the project area in all seasons, such as multi use paths (MUPS) and designated recreation nodes as described in the Town's "Trail system Master Plan".

1. EIR/EIS figure 3.14-1 for example is incomplete. Please see "Map 4-7: Recommended Trail System" from the Town's "Trail System Master Plan" which should be referenced for the location and type of Mammoth Lakes Trail System facilities.
2. EIR/EIS figure 4.14-1 ("Shady Rest Area Recreational Facilities") should have a companion map for winter uses as the configuration of winter and summer recreation opportunities are sufficiently different that they require individual analysis. This approach was taken in the Town's "Trail System Master Plan" - see map "MAP 4-8: Shady Rest Recommended Winter Use" as an example.

I10-8

Environmental Consequences

Air Quality

Town of Mammoth Lakes Comment: B1 – Air Quality *"Section 4.2.4.2.a) concludes that the project would not conflict with the Town of Mammoth Lakes Air Quality Management Plan because the project would not include fires of any kind. However, a significant source of PM^{10} and $PM^{2.5}$ pollution in Mammoth Lakes is associated with re-entrained road dust and cinders, and directly correlates to the amount of vehicular traffic operating on local roads. Accordingly, an important control measure included in the Town's Air*

Quality Management Plan and associated Ordinance is to maintain total Vehicle Miles Travelled to less than 106,600 VMT. The analysis is insufficient because it does not include an assessment of the project's consistency with this control measure or the impacts of PM^{10} associated with vehicle road dust, or a quantification of VMT associated with the construction and operation of the project. "

1. MLTPA Comment - Air Quality: "Town of Mammoth Lakes Comment: B1 – Air Quality" This is an important comment that we support. I10-9

Land Use

Town of Mammoth Lakes Comment: B2 – Land Use *"Policy S.3.W. in the Town of Mammoth Lakes General Plan states: "If geothermal power generating facilities are developed on National Forest lands west of Highway 395, the Town shall work with the Mono County Local Agency Formation Commission (LAFCO) to review the municipal boundary and shall annex development if appropriate." The intent of this policy is to allow the Town to recoup property taxes and fees to offset the impacts of the geothermal operations on Town services. The EIS/EIR land use analysis fails to take note of this policy, does not analyze the project's conformance with it, nor the fiscal impacts of the project in the form of increased demand for Town services. (The analysis in Chapter 4.15 is limited to the fiscal benefits of the project, and does not discuss costs).*

"Since development of the CD-4 project would trigger the requirements of Policy S.3.W. it is the Town's position that the project applicant should bear the cost of preparing the LAFCO study called for by the General Plan, to determine if annexation of the land containing project facilities is appropriate. "

1. MLTPA Comment - Land Use: "Town of Mammoth Lakes Comment: B2 – Land Use" This is an important comment that we support. The fiscal impacts of the project must also include an analysis of existing recreation use in the project area so that the effects of the project on recreation activity in the project area can be analyzed and the costs to the Town and the Community of disturbed or redistributed recreation activity to other sites can be analyzed and potentially mitigated. The local economy is tourism based and recreation-opportunity driven. It should be noted that the Town has recently settled a multi-million dollar legal dispute and has agreed to a 20-year program of $2 million annual payments. The Town will not have resources to address negative impacts of the project that are not adequately analyzed through the EIR/EIS process with impacts to local citizens' quality of life and a potential degradation of the visitor experience properly analyzed, identified, and mitigated. I10-10

Recreation

Town of Mammoth Lakes Comment: B3 Recreation *"In the scoping letter submitted by the Town, many of the Town's comments focused on the potential impacts of the project on recreation, which is a major factor in our local economy and the quality of our local environment.*

"The scoping comments requested that alternatives looking at underground and at-grade crossings be analyzed. An alternative that would underground the entire pipeline was considered but rejected. The preferred alternative includes undergrounding of pipeline segments that cross Forest Service and other "official" roads. While the Town appreciates the effort to mitigate the impact of pipeline crossings on roads and recreational uses, we do not believe the analysis provides an adequate assessment of the impact on recreational uses, nor do any of the alternatives, mitigation measures or proposed PDMs fully address those impacts. The following recreation-related impacts are not properly analyzed or mitigated:"

1. MLTPA Comment - Recreation: "Town of Mammoth Lakes Comment: B3 Recreation" This is an important comment that we support. MLTPA Comment #2 on "Project Description and Affected Environment" speaks to a documented history of confusion in the region with regards to maintenance responsibilities on local roads. This same type of confusion exists with regards to the status of "use trails" and "USFS system trails" in the region and in the project area. We believe that the analysis of recreation uses in the project area is inadequate and that confusion exists with regards to the specific status of a variety of "use" and "system" trails in the project area. I10-11

2. MLTPA Comment - Recreation: Beyond the inadequacy of the topographic analysis of "use trails" and "USFS system trails" in the project area, there has been inadequate analysis of recreational use patterns in the project area that may not use any type of trail at all but is simply "cross country" travel, which is a legal and sanctioned activity on public lands. Anecdotal evidence demonstrates that these uses exist and that therefore the project analysis inadequately documents the projects impacts on these activities and on the adequacy of the proposed pipeline crossings being coincident only with USFS system infrastructure. I10-12

Town of Mammoth Lakes Comment: B3a - Recreation *The installation of multiple pipelines, and widening of the footprint of existing pipelines will substantially change the recreation experience of motorized and non-motorized users of the Shady Rest Park trailhead. The introduction of new barriers may severely limit the use of this as a trailhead, because recreation options particularly from the trailhead to the south and west, will be impeded by the pipelines."*

3. MLTPA Comment - Recreation: "Town of Mammoth Lakes Comment: B3a – Recreation" This is an important comment that we support. We believe that I10-13

a complete analysis will demonstrate that recreation options will be impeded in all directions due to the pipeline. The analysis of recreation activity relative to the Shady Rest Park Trailhead and indeed in the entire project area is inadequate.

I10-13 cont'd

Town of Mammoth Lakes Comment: B3b - Recreation *"The mitigation measures and PDM's proposed do not fully mitigate the effect of the new and expanded pipeline system on trails and non-system roads because many of those routes would be blocked by pipeline crossings. Mitigation measures to underground pipelines wherever they cross any established trail or road, and not just system roads, should be added or an alternative considered that would underground additional segments of pipeline where they cross other roads and trails used for recreation purposes."*

4. MLTPA Comment – Recreation: "Town of Mammoth Lakes Comment: B3b – Recreation" This is an important comment that we support. The Town's comment to bury pipelines wherever they cross an "established trail or road" makes sense. Once again, a thorough and professional analysis of recreation patterns in the project area would demonstrate conflicts with the proposed pipeline where effects could be demonstrated and mitigation measures proposed and implemented.

I10-14

5. MLTPA Comment – Recreation: There may be less expensive alternatives to pipeline burial, but until an adequate analysis of recreation activities and use patterns in the project area is completed, the impacts of the pipeline cannot be understood and adequate mitigation measures cannot be properly considered.

I10-15

Town of Mammoth Lakes Comment B3c - Recreation *"The effect of plowing roads for access to wellheads on over-snow recreation (motorized and non-motorized) is not analyzed. Crossing such plowed roads on skis or snowmobiles is likely to be extremely difficult and may be hazardous, particularly in heavy snow years when plowing can create large snow berms and grade changes between the road and adjacent areas. These impacts should be fully described and analyzed in the EIS/EIR."*

6. MLTPA Comment – Recreation: "Town of Mammoth Lakes Comment B3c – Recreation" This is an important comment that we support. In addition to the adverse effects that the Town identifies related to a winter road plowing program, the timing, scheduling and phasing of any plowing – or potentially grooming - program must be integrated into the local recreation communications infrastructure consistent with best practices currently being deployed in the community. A thorough analysis of winter recreation activities and use patterns that engage with the system of roads in the project area must be undertaken and analyzed so that opportunities for a variety of snow management practices can be analyzed in light of the needs of the project and the documented uses of recreationists. These impacts and opportunities should be fully described and analyzed in the EIS/EIR.

I10-16

Town of Mammoth Lakes Comment: B3d - Recreation *"The analysis focuses on effects on winter recreation, and does not provide an adequate assessment on effects on summer recreation, particularly the blocking of trails and non-system roads that would be caused by the additional pipelines."*

7. MLTPA Comment – Recreation: "Town of Mammoth Lakes Comment: B3d – Recreation" This is an important comment that we support. The analysis needs to adequately assess the effects of the pipeline on "cross country" travel that may not be related to an established trail or road. **I10-17**

Town of Mammoth Lakes Comment: B3e - Recreation *"As noted in Comment A.1. above, the impact analysis does not consider the fact that in some places three or four pipelines would be placed parallel to one another. The analysis should be revised to account for the additional obstacles and barriers presented by these extremely wide segments where multiple pipelines would run in parallel."*

8. MLTPA Comment – Recreation: "Town of Mammoth Lakes Comment: B3e – Recreation" This is an important comment that we support. The analysis needs to adequately address the effects of the expansion of pipelines on crossings where pipelines are buried and how additional pipelines will affect these crossings. **I10-18**

Town of Mammoth Lakes Comment: B3f - Recreation *"The analysis fails to quantify or provide a numeric estimate of the level of use of the trails and road system by recreationists in the winter and summers, resulting in an inadequate assessment of the impacts of the project on current and future users."*

9. MLTPA Comment – Recreation: "Town of Mammoth Lakes Comment: B3f – Recreation" This is an important comment that we support. Please see our previous comments that support the need to quantify and provide numeric estimates of the level of recreation use – and the variety of recreation activities – in the project area in order to properly assess the impact of the project on current and future recreation users. **I10-19**

Town of Mammoth Lakes Comment: B3g - Recreation *"The EIS/EIR fails to analyze the effects of the project on the distribution and patterns of recreational use in the Shady Rest area. In particular, because of the obstacles and barriers presented by the new pipelines, motorized and non-motorized users will be funneled into similar areas, creating safety hazards and potential conflicts between the two."*

10. MLTPA Comment – Recreation: "Town of Mammoth Lakes Comment: B3g – Recreation" This is an important comment that we support. The needs of the proposed pipeline crossings cannot be anticipated until the EIR/EIS properly analyzes the distribution and patterns of recreational use in the **I10-20**

shady Rest area. The EIR/EIS must analyze the number, type of activity, and distribution of recreationists in the project area so that the consequences of the proposed "funneling" of the full variety of recreation users through the proposed pipeline crossings can be appropriately analyzed.

I10-20 cont'd

Town of Mammoth Lakes Comment: B3h Recreation *"The Town understands that a snowmobile concessionaire is currently in discussion with the Forest Service regarding location of operations in the Shady Rest Area. The impacts of introducing many new snowmobile trips, including by inexperienced riders, into this area, particularly with the constraints noted above, should be analyzed in the EIS/EIR."*

11. MLTPA Comment – Recreation: "Town of Mammoth Lakes Comment: B3h Recreation" This is an important comment that we support. The impacts of fluctuating and new recreation activities in the project area should be analyzed by the EIR/EIS so as to understand the future constraints on recreation activity in the area. The "unmitigateble constraints" of the proposed pipeline infrastructure should be analyzed in terms of the cumulative effects on recreation experiences in the Mammoth Lakes region.

I10-21

Town of Mammoth Lakes Comment: B3i Recreation *"The analysis of recreational impacts is inadequate because it does not account for changes in topography, trees, etc. in the Shady Rest Area that block short-range views and may make it difficult for trail users to anticipate encountering pipelines, well pads and fencing, sudden grade changes and other obstacles caused by the project. Such hazards and impacts should be discussed, and mitigation measures included to address them."*

12. MLTPA Comment – Recreation: "Town of Mammoth Lakes Comment: B3i Recreation" This is an important comment that we support. The analysis of recreational impacts should account for changes in topography, trees, etc. in the Shady Rest Area from the perspective of the full complement of recreation uses – fast moving, cross country activity such as OSV to hikers in the woods - that block short-range views and may make it difficult for recreationists to anticipate encountering pipelines, well pads and fencing, sudden grade changes and other obstacles caused by the project. Mitigation measures should consider signage and wayfinding, flagging, and smart phone tolls that can advise recreationists on crossing opportunities and the proximity of obstacles caused by the project.

I10-22

Town of Mammoth Lakes Comment: B3j Recreation *"In its scoping comments, the Town requested an analysis of the rate of snowmelt associated with the pipelines that will be carrying hot geothermal fluid. Although the project description notes design features to insulate the pipes and prevent heat loss, no evidence or analysis is provided to demonstrate that areas above buried pipelines or adjacent to at grade pipes, will not be subject to an increased rate of snow melt. If there will be increased*

snowmelt (and it seems logical to assume that there would be) then the impacts and effects of this should be analyzed in the EIS/EIR."

13. MLTPA Comment – Recreation: "Town of Mammoth Lakes Comment: B3j Recreation" This is an important comment that we support. The analysis of the snow melts' effects should be analyzed from the perspective of the full variety of winter recreation activities that takes place in the project area. **I10-23**

14. MLTPA Comment – Recreation The proposed EIR/EIS mitigation measure ("4.14.9 Mitigation Measures") demonstrate the failure of the EIR/EIS to provide an appropriate level of recreation analysis for the project area. The community of Mammoth Lakes has made significant investments in electronic and web based information sharing opportunities through the Mammoth Lakes Trail System website (www.mammothtrails.org), a multi agency distribution platform for recreation information in the Mammoth Lakes region. Mitigation measures for information sharing should clearly include both digital and web based opportunities such as the Mammoth Lakes Trail System website as well as the analog methods described. **I10-24**

15. MLTPA Comment – Recreation The EIR/EIS recreation analysis is insufficient as it fails to analyze the management requirements for public agencies managing multiple recreation activities happening simultaneously in the project area in multiple seasons of the year including heavy winters. The project area has been the site of disputes and confrontations between a number of different users and user groups over many years. The opportunity for misunderstandings, disputes and confrontations continues to this day. The recreation analysis needs to analyze the agency resources necessary to plan and program multiple recreation activities happening simultaneously in the same place, and analyze the needs for public agencies and the community to program, outreach, and provide reliable information given the identified impacts of the proposed project on the project area. **I10-25**

Noise

Town of Mammoth Lakes Comment: B4 – Noise *"The EIS/EIR provides an analysis of noise effects on Shady Rest Park, the Shady Rest Campgrounds, and other sensitive receptors, concluding, for both of those mentioned, that the impacts would be less than significant. The Town does not agree with the analysis methodology or significance findings."*

Town of Mammoth Lakes Comment: B4a – Noise *"Several well-heads, generating noise over 70dBA would be audible from Shady Rest Park. The EIS/EIR provides a conclusory statement that, because of the "typically" noisy activities that occur at Shady Rest Park, the noise impacts would not be significant. While there are some occasions when noisy sporting and other events take place at Shady Rest, for the majority of the day and*

throughout the year, park users enjoy a quiet environment and participate in a range of recreation activities that are not noisy. Because no existing ambient noise measurements were taken at Shady Rest Park, it is not possible to conclude that there would be no noise impact, nor that the effect on the noise environment is less than significant."

Town of Mammoth Lakes Comment: B4b – Noise *"Furthermore, the threshold used in the study is not appropriate because it assumes the appropriate acceptable noise threshold the daytime and nighttime exterior noise standards for one and two family residences. Because of the nature of the facilities (a park in a rural setting, and a campground) the Town believes an alternate and lower threshold should be applied. The analysis also ignores other thresholds for noise impacts established in the Town of Mammoth Lakes Municipal Code. These standards determine there to be a significant increase in noise when operational noise sources increase ambient levels at the nearest receptors by more than 5dBA where ambient noise levels remain below the Town's Exterior Noise Standards and by 3 dBA when noise levels exceed the Town's Exterior Noise Levels. The study and analysis is inadequate because it fails to consider the proper thresholds, quantify the current ambient noise conditions at either the park or the campground, establish the change in noise levels associated with the proposed project, or use the proper significance threshold."*

Town of Mammoth Lakes Comment: B4c – Noise *"The cumulative noise effects of multiple wells operating, in proximity to Shady Rest Park, are not considered, and need to be included in the analysis."*

Town of Mammoth Lakes Comment: B4d – Noise *"Because no impacts to Shady Rest Park are identified, no mitigation measures are stated. The Town believes that if the noise analysis were properly conducted, noise impacts would be found to be significant. In such a case, appropriate mitigation measures, such as use of noise attenuating fencing or casing of well equipment to reduce noise, should be identified."*

1. MLTPA Comment – "Town of Mammoth Lakes Comment: B4, a,b,c,d – Noise" All of the Towns' comments relative to Noise are important and are comments that we support. The EIR/EIS is compelled to complete a thorough and technically proficient noise analysis. As commented earlier, the EIR/EIS is compelled to conduct the same type of analysis for recreation usage. The following recreation activities that take place within the project area have been identified as potentially being impacted by unacceptable levels of noise: Birding; Camping; Cross County Skiing; Hiking; Interpretive; Mountain biking; Pets; Running; Snowshoeing; and Vista Viewing. Once a recreation analysis is complete, the effects of noise on recreation activities in the project area can be potentially understood and potentially mitigated, but a technically proficient and professionally acceptable noise analysis will be necessary. **I10-26**

Transportation/Traffic

Town of Mammoth Lakes Comment: B5a – Transportation/Traffic *"Sawmill Cutoff and the Shady Rest Park access roads were designed and constructed for use as seasonal, non-winter roads. The transportation analysis should analyze the impact of year-round use by vehicles serving the project facilities, and the increased use by the public taking advantage of the fact that these roads will now be open all year. The analysis should address the service life, long-term impact, and cost of maintenance to maintain these roads on a year round basis. Mitigation measures can then be developed from this analysis."*

1. MLTPA Comment – "Town of Mammoth Lakes Comment: B5a – Transportation/Traffic" This is an important comment that we support. In addition to the further analysis proposed by the town, the further analysis will need to analyze the roles that both the Sawmill Cutoff and the Shady Rest Park access roads play as part of existing recreation systems, and what roles they will need to play given the implementation of the proposed project. For example, Sawmill Cutoff road – prior to the plowing experiments proposed by the applicant - was a groomed, shared multi use access corridor. Should the project's experiments with the winter maintenance programs for both roads be extended past the experimental stage, the analysis must examine their existing roles so that the projects' effects can be understood and appropriate mitigation measures considered. I10-27

Town of Mammoth Lakes Comment: B5b – Transportation/Traffic *"PDM TR6 states that "ORNI 50 LLC will attempt (emphasis added) to work with the Town of Mammoth Lakes and USFS to plow the road to and the parking lot at Shady Rest Park in the winter to better accommodate recreational traffic and parking for cross-country skiers and snowmobilers." The Town does not believe this measure provides sufficient certainty to the Town or USFS that plowed access will be maintained, and it is therefore inadequate. PDM TR-6 should be revised to require ORNI 50, LLC to work with the Town to ensure that plowing and maintenance of these roads is performed at a level satisfactory to the Town and in compliance with all Town and Municipal Code requirements with regard to these Town-operated roads."*

2. MLTPA Comment – "Town of Mammoth Lakes Comment: B5b – Transportation/Traffic" This is an important comment that we support. As previously stated in our support of "Town of Mammoth Lakes Comment: A2", it is of vital importance that responsibilities for maintenance of recreation opportunities be identified and maintained. This points once again to the need for a thorough analysis being conducted with regards to recreation activities in the project area and the facilities on which those activities take place. An "attempt" to maintain a recreation facility in an area that has seen much contentious debate over many years – and exists within a geography of interagency jurisdictional overlap - without a satisfactory I10-28

analysis of recreation activities is inadequate. Vague statements of maintenance responsibilities constitute impacts that require mitigation. I10-28 cont'd

Town of Mammoth Lakes Comment: B5c – Transportation/Traffic *"The PDMs should also include measures that ORNI 50, LLC will obtain and comply with a Town Encroachment permit for all construction and access activities on Town maintained facilities. TR7. Sawmill Cutoff road has only 22 feet of paved width with very heavy traffic in the summer. The current speed limit is 25 mph, however, construction traffic should be limited to 15 mph in order to minimize conflicts between large construction vehicles and other users."*

3. MLTPA Comment – "Town of Mammoth Lakes Comment: B5b – Transportation/Traffic" This is an important comment that we support. In addition to modifications to the speed limit, the hours of access should be constrained for all heavy equipment as Sawmill Cutoff Road is proximate to two campgrounds, with undesirable effects of noise and dust that should be anticipated constrained to reasonable hours during the day. I10-29

Visual Impacts

Town of Mammoth Lakes Comment: B6 – Visual Impacts *"The evaluation of visual impacts focuses on views of pipelines from certain trails, including the Knolls Trail. The Town believes that the impact analysis both understates the visual impact of pipelines that can be seen from roads and trails, and presents mitigation measures (i.e. installation of screening vegetation) that will not fully address the visual impacts of the pipelines. Any new screening vegetation planted will take several years to become established, and even when grown, will be unlikely to be able to screen views from all public roads and trails. The impact analysis and significance finding should be revised to fully acknowledge the visual impacts of the project, which will be more extensive than stated in the EIS/EIR."*

1. MLTPA Comment – "Town of Mammoth Lakes Comment: B6 – Visual Impacts" The Towns' comments relative to Visual Impacts are important and are comments that we support. The EIR/EIS is compelled to complete a thorough and technically proficient visual impacts analysis. As commented earlier, the EIR/EIS is compelled to conduct the same type of analysis for recreation usage. The following recreation activities that take place within the project area have been identified as potentially being impacted by the visual impacts of the project: Adaptive Options; Birding; Camping; Cross County Skiing; Hiking; Interpretive; Mountain Biking; OHV; Pets; Photography; Running; Snowmobiling; Snowshoeing; and Vista Viewing. Once a recreation analysis is complete, the effects of the visual impacts on recreation activities in the project area can be potentially understood and potentially mitigated, but a technically proficient and professionally acceptable visual impacts analysis will be necessary. I10-30

Socioeconomics

Town of Mammoth Lakes Comment: B8a – Socioeconomics *The analysis states that the new plant will only have 6 new full time employees. This number does not appear to be sufficient to provide staffing 24 hours a day 7 days a week for operations and emergency needs.*

1. MLTPA Comment – "Town of Mammoth Lakes Comment: B8a – Socioeconomics" This is an important comment that we support. I10-31

Town of Mammoth Lakes Comment: B8b – Socioeconomics *Section 3.15.1 seems to overstate the rental vacancy rate and does not discuss rental types or affordability, and how they would correspond to the wages for project workers. Many of the units in the Town of Mammoth Lakes and Mono County are second homes and are not available for long-term rental. Moreover, the rental vacancy rate varies considerably by season, with a greater shortfall of affordable rental units available in winter months. The EIS/EIR should also provide an analysis on demand for campgrounds if workers are allowed to camp on USFS and campgrounds, and how this would affect the availability of campsites for recreational users.*

2. MLTPA Comment – "Town of Mammoth Lakes Comment: B8b – Socioeconomics" This is an important comment that we support. I10-32

3. MLTPA Comment – Socioeconomics – The EIR/EIS fails to provide a cumulative effects analysis of the project on recreation opportunities in the project area. The Town and community of Mammoth Lakes exist as a recreation based tourism destination. The local economy is inexorably linked to the quality and availability of recreation opportunities that emanate from the Town. Millions of dollars are expended annually to promote the desirability of Mammoth Lakes as a recreation destination. The community has twice voted in back to back elections to impose "special 2/3 +1" tax initiatives ("Measure R" 2008; "Measure U", 2010) for the specific benefit of Trails, Parks, Recreation, Mobility and Arts and Culture knowing that investments in these areas are vital to the community's viability. Should a thorough analysis of the cumulative effects on recreation opportunities in the Shady Rest area demonstrate a degradation of recreation experiences currently offered in the project area, it would be possible to mitigate these effects through planning and implementation measure already under consideration by the Town and the community. Visitors will certainly seek to have their recreation experiences satisfied in areas in and around the Town that do not host industrial facilities such as the proposed project. A cumulative effects analysis of the effects of the project in the Shady Rest should be conducted as part of the EIR/EIS with negative effects considered for mitigation in other sub regions in and around Town appropriate for the effected activities. These sub regions have been identified as part of planning efforts for the Mammoth Lakes Trail System. Planning for such I10-33

opportunities are available through the Town's Tail System Master Plan, SHARP, and other adopted documents. **I10-33 cont'd**

We appreciate your consideration of these comments. Please contact me if you have any questions or if we can be of any further assistance.

Best,

John Wentworth
CEO/Board President MLTPA

In support of the comments provided herein:

Organization/Name	Signature	Date
Malcolm Clark, Chair Range of Light Group, Toiyabe Chapter, Sierra Club	Malcolm Clark	January 30, 2013
John Armstrong Eastside Velo		January 30, 2013 1/30/13.
Recreational Dog Musher	Laurel Martin	1/30/13
long-time local resident	Cathy Copeland	1/30/13

Organization/Name	Signature	Date
[illegible]	[illegible]	1/30/13
ANDREW KASTOR	[illegible]	1/30/13
Laura Beardsley Friends of the Inyo	[illegible] GLEN WENTWORTH FOR LAURA BEARDSLEY	1/30/13
	John Wentworth for Laura Beardsley per electronic request (see attached)	

Correspondence between Friends of the Inyo and MLTPA re: CDIV EIR/EIS comments:

Sent 1/30/13 3:05 PM

Hey - Drew says FOI will sign the Shady Rest/ORMAT letter but that he can't get me a physical signature - what should I do ? Should I sign "For" you guys?

Received 1/30/13 4:23 PM

not sure. Let me see if Paul can meet you somewhere. Drew has the flu and I'm at a conference in Pacific Grove..

Received 1/30/13 4:23 PM

Hi John- Go ahead and sign for us. I can't seem to read the document from my phone, but Drew is supportive, and I like all the conversations I've been part of. Thanks for including us and for pulling these together. Let me know if you have any questions.

Received 1/30/13 4:23 PM

MLTPA
MAMMOTH LAKES TRAILS · PUBLIC ACCESS

CDIV – Activities for Map/Crossing Analysis
Activities used for Project Area Analysis

Adaptive Options
Biking
Birding
Boating
Camping
Climbing
Commuting
Cross Country Skiing
Disc Golfing
Dog Sledding
Equestrian
Fall Color Viewing
Fishing
Geocaching
Hiking
Ice Skating
Interpretive
Kiteboarding
Mountain Biking
Off Highway Vehicles
Paddleboarding
Pets
Photography
Running
Skateboarding
Ski and Snowboarding
Snowmobiling
Snowplay
Snowshoeing
Swimming
Vista Viewing
Wildflower Viewing

PO Box 100 PMB 432 Mammoth Lakes, CA 93546-0100
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Range of Light Group
Toiyabe Chapter, Sierra Club
Counties of Inyo and Mono, California
P.O. Box 1973, Mammoth Lakes, CA, 93546
Rangeoflight.sc@gmail.com

SIERRA CLUB
FOUNDED 1892

January 30, 2013

To: Collin Reinhardt, Project Manager, BLM Field Office Bishop
From: Malcolm Clark, chair, Ranger of Light Group, Toiyabe Chapter, Sierra Club
Re: Casa Diablo IV Geothermal Development Project Draft EIS/EIR
Date: January 30, 2013

Dear Mr. Reinhardt,

This note is to inform you that the comments on the DEIS for the Casa Diablo IV Geothermal Development Project were submitted as an attachment to an email sent to you on the afternoon of January 30, 2013. This snail mail simply provides a hard copy of that electronic submission and is identical to it.

Thank you,

Malcolm Clark

RECEIVED FEB 0 1 2013

Malcolm Clark, Chair
Range of Light Group, Toiyabe Chapter, Sierra Club
PO Box 1973, Mammoth Lakes, CA 93546-1973
760-924-5639 (personal phone number)
Rangeoflight.sc@gmail.com

RECEIVED FEB 0 1 2013



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SIERRA CLUB
FOUNDED 1892

January 30, 2013

Collin Reinhardt, Project Manager
BLM Bishop Field Office
351 Pacu Lane, Suite 100
Bishop, CA 93514
Via email: cabipubcom@blm.gov; creinhardt@blm.gov
Attn: Casa Diablo IV Geothermal Development Project Draft EIS/EIR

Dear Mr. Reinhardt:

Thank you for the opportunity to comment on the Joint Draft Environmental Impact Statement/Environmental Impact Report for the Casa Diablo IV Geothermal Development Project. The Range of Light Group (ROLG) is the local group of the Sierra Club (covering Inyo and Mono Counties) and one of four groups in the Toiyabe Chapter of the Sierra Club. The comments below are those of our group alone, although we believe them to be consistent with the policies and goals of our chapter and the national club. The "motto" of the Sierra Club is "enjoy, explore, and protect the planet". Our local group has for the past 25 years attempted to embody this motto through its regular summer and winter outings, its educational activities, and its activities aimed at protecting, conserving, and restoring the environment – especially in Inyo and Mono Counties. The Sierra Club is very concerned about the threat of climate change and global warming and pursues policies designed to cut our carbon footprint. This includes strong support of the development of renewable energy resources, including geothermal energy. We are committed to working with agencies and project developers to minimize any negative impacts of such development. ROLG participated in the preliminary interview process and submitted comments to the Scoping announcement in May, 2011. We recognize that many concerns raised by ROLG and others at the Scoping stage have been addressed in this DEIS. However, there are significant concerns that we feel have not been adequately addressed, if at all. In the case of one endangered species, we believe that the DEIS does not meet the legal requirements under NEPA, CEQA, and the ESA. After the release of the DEIS, ROLG attended the December public meeting hosted by BLM, INF (Inyo National Forest), and GBUAPCD (Great Basin Unified Air Pollution Control District) with participation of Ormat. ROLG has shared its views on the DEIS and the project with other groups including CBD (Center for Biological Diversity) and in some cases seen draft versions of comment letters on the DEIS. Based on these meetings, conversations, and draft comments, we support the positions of CBD, MLTPA (Mammoth Lakes Trails Public Access), TOML (the Town of Mammoth Lakes),

I11-1

Mammoth Nordic, and the concerns of the MCWD (Mammoth Community Water District) regarding the DEIS. Many of our comments closely echo comments those organizations will make. In line with the goals and purposes of our national club, as expressed in the motto mentioned above, this comment letter will focus on recreational concerns and environmental concerns. We point out the obvious factor that the project is located immediately adjacent to the TOML, the largest town and urban area in Mono County, and thus some impacts of the project are likely to have a much greater social and economic impact than if the location were elsewhere. I11-2

ENDANGERED SPECIES: the Owens tui chub.
The Owens tui chub is the endangered species potentially most at risk from the project. The ESA sets very high requirements for dealing with endangered species that might be affected by a project. ROLG believes the DEIS does not satisfy these requirements. Please see the comment letter of CBD for more detail on this issue.

1. The DEIS admits "limited potential" for adverse impact on the Owens tui chub and/or its critical habitat. This is sufficient to trigger a "may effect" determination which requires that the DEIS must include alternatives and mitigations that will mitigate or eliminate the danger. That a negative effect is deemed unlikely does not remove the requirement to include and analyze such alternatives. All three included alternatives (not including the "no action" alternative that is always included) have the same effect as pertains to the possible threat to the Owens tui chub. Alternatives such as moving or eliminating the new wells on the east side of highway 395 (that might have the greatest effect on the habitat of the fish), reducing the amount of water to be withdrawn (thus also reducing capacity of the project) or others are not mentioned. I11-3

2. The DEIS notes that the Hot Creek Fish Hatchery Springs will experience a decline of about 17% decline but fails to analyze the effect of the decline, choosing simply to conclude its effect is minimal because no Owens tui chub are present in that specific area. But see the next comment about requirement for inclusion of indirectly impacted areas in the analysis. Further, new, unmentioned 2012 LVHAC (Long Valley Hydrologic Advisory Committee) data shows decrease in output of thermal springs in the area. If this is so, it is reasonable to consider whether the additional water pumping of the project will lead to further decrease in output. I11-4 I11-5

3. The DEIS defines the habitat area for analysis too narrowly for an endangered species in not giving sufficient attention to the Hot Creek Fish Hatchery Springs area. Both directly and indirectly impacted area are required to be included. I11-6

4. The DEIS states that further monitoring plans will be developed as necessary after approval of the project. This is inadequate. Mitigations must be specified and detailed as part of the DEIS prior to approval of the project. I11-7

OTHER ENVIRONMENTAL EFFECTS

1. WATER: ROLG has reread the scoping comments of the MCWD and is aware that the MCWD as of this month was still concerned about water issues and felt that the DEIS failed to provide sufficient information to evaluate the claims made regarding effect on increased pumping (deep ground water) on the shallow ground water resources that provide part of the town's water supply. Due to proximity to town supply, for health reasons it is necessary to ensure that mixing of deep and shallow ground water resources will not occur, or if they occur will not affect public health negatively. ROLG does not have the technical expertise to make this evaluation but supports the analysis by MCWD of water resources given their long history of dealing with this issue. I11-8

2. AIR POLLUTION: while fire and smoke pollution due to the project (minor if any) are noted, dust pollution – especially from vehicle traffic – is not dealt with as noted in the comments of the TOML. Significant air pollution in Mammoth Lakes comes from cinders used on paved roads and travel on area unpaved roads. Contribution of construction and maintenance vehicular traffic to PM10 and PM25 pollution should be analyzed, with attention to the TOML's Air Quality Management Plan that states total Vehicle Miles Travelled should be less the 106,600 VMT. Besides being a health hazard, air pollution also negatively impacts the recreational activities in the project area and thus the economic benefits of this recreational activity. I11-9 I11-10

RECREATION EFFECTS

ROLG members utilize the project area extensively for outings, including formally scheduled winter and summer outings as part of our weekly outings program. ROLG believes that the DEIS leaves unanalyzed or insufficiently analyzed many concerns related to recreation effects of the project. These concerns and missing analyses are noted in more detail in the comments of MLTPA, Mammoth Nordic, and the TOML. The Shady Rest Park and its surroundings constitute a key recreational area of the town, essential both to residents and visitors in this tourism based town. I11-11

1. Summer recreation is given at best passing attention, and winter analysis lacks detail necessary if effects of the project on recreation are to be determined. Such analysis should include attention to the various and multiple types of recreation as the impact will not be the same on all users. Analysis should include quantification (number of users), patterns and distribution of use. Such analysis is a precondition of determination of impacts of the project on recreation and consideration of suitable mitigations. I11-12

2. Only INF system roads are considered in the analysis. In addition to the winter Mammoth Nordic trail system, many other locally recognized trails are utilized for recreation both winter and summer. Such trail use should be included in the analysis and the effects of the project on such trail use noted with appropriate mitigations (trail rerouting, etc.). In addition, especially for winter, off-trail use should be considered. Much cross-country ski and snowmobile activity is off trail and likely to be severely constrained by the pipelines. Further departure points for access to widely used areas beyond the project originate in the project area and thus the effect on this usage should be considered and mitigated where necessary. I11-13 I11-14

3. Separation of motorized and non-motorized users to avoid inevitable conflicts and to increase the positive recreational experience of both types of users is crucial in this heavily used area and something which current plans and goals have been attempting to achieve. The effect of the project on the ability to maintain or achieve such separation of usage should be analyzed. Having few pipeline crossings will have the contrary effect of channeling motorized and non-motorized users together, impacting both negatively. I11-15

4. Up to three or four parallel pipelines are projected in some areas. The effect of the pipeline should be analyzed more fully in terms of trail usage and visual impact.

a. Visual: in a resort town, visual impact is recognized as a key planning concern. Building projects in town include analysis of visual effect (both view to the project and any impediment the project may provide for the view of others). Such analysis sometimes includes computer simulations, and field trips with appropriate apparatus to approximate the effect of the project on the view shed. In the case of the Turner Propane Farm (on the south side of town), the visual effect was a significant concern, especially due to the prominent visibility of the project from surrounding higher trails. Visual impact is mentioned, but analysis is limited and thus it is difficult to evaluate the effectiveness of mitigations proposed (screening, etc.). Field trips should be provided to users to provide information on potential visual impacts. Field trips could also help the project gather information on non-system trails impacted by the project. I11-16

b. The effects of the pipelines (height, width) should be analyzed. Further crossings may be necessary. I11-17

c. It is noted that the pipeline will be insulated but no information is provided on possible melting around the pipeline and the effect on trail usage, pipeline crossings, and any possible danger to those coming up to the pipeline (especially in winter). Even is there is no melting, this should be documented and not merely stated. I11-18

d. At best, the pipeline will be a major impediment to trail and cross country users in summer and winter. Mitigations should be noted to provide sufficient signage. Information could also be provided as in the signage for the TOML trail system by smart phone. Signage must be flexible as consideration will have to be taken of differences between summer and winter, and varying snow heights in winter (snow buried signs would provide no guidance as to where/how to cross the pipeline). I11-19

5. Impact of the project should be analyzed in the light of the town's Trail System Master Plan. The plan is referenced but insufficient attention is given to it in the DEIS analysis: restrooms, grooming requirements, staging areas (nodes) and their facilities. This plan also includes guidelines for signage. Any trail signage used as a result of this project should conform to these sign guidelines. I11-20

a. Analysis should reference and take account of the INF Shady Rest Motorized Staging project. (goals and likely regulations). I11-21

6. Noise: the noise analysis of the DEIS is inadequate and should be redone. Reference is made only to the TOML noise level ordinances for 1 and 2 homes residential areas. This reference is not relevant to the Shady Rest area which is much quieter. The DEIS says that noise is insignificant due to loud activities in the Shady Rest Park. However, most of I11-22

the time such noisy activities are not present. Indeed, "quiet" is a key amenity for many of the recreational activities that occur in the project area. Noise can be heard from several of the existing production wellheads and the cumulative noise will increase under the proposed project. As a baseline for analysis, a study should be conducted to determine the current ambient noise level (especially in absence of loud sporting events). Further noise analysis and possible mitigation measures would then be determined in reference to that established baseline. This provides professional expertise and should not be based on cursory, anecdotal "noise" information. I11-22 cont.

a. Noise mitigation should also include restrictions on speed of vehicles on access roads and their permitted hours of operation. I11-23

8. Odors near at least two production wells were mentioned in scoping comments and at the December agency presentation after publishing of the DEIS. This potential negative effect on recreation (and possibly health?) should be explicitly addressed. Chapter 4 of the DEIS addresses "odor" in a number of places but simply asserts that this should not be a problem. The DEIS does not recognize comments made about existing odors previously made in meetings and scoping letters and thus does not analyze these existing odor effects or possibility of cumulative effect from additional wells. I11-24

9. It is insufficient to say that Ormat will attempt to work with the TOML and the Forest Service to plow the access road and parking lot. Responsibility for maintenance of roads must be determined prior to approval of the project. Mammoth has a history of inadequate maintenance of some roads due to uncertainty of who is responsible for such maintenance and what is the source of funds for maintenance. It is unlikely that either the INF or the TOML is or will be in a financial position to assume responsibility for maintenance and plowing of roads (including extension of existing roads) required by the project. I11-25

a. The DEIS should also address the effect of the access roads themselves as a impediment to trail use in winter – difficulty of snowmobiles and cross-county skis crossing plowed roads, snow berms (if/when present) as barriers to trail usage. I11-26

b. The extension of the access road and the additional plowing in winter will inevitably lead to increased usage of the area by some (e.g., dog walkers) and the degree of and effect of increased usage should be included in the analysis. I11-27

OTHER

While we have not concentrated on economic effects except in so far as they affect the ability to mitigate environmental and recreation effects, we do support the TOML comments in this area. With reduced resources available to both the TOML and the INF, neither is likely to be able on their own (or together) to undertake serious mitigation measures (relocation of trails, trailheads, maintenance of roads, plowing). I11-28

Further we note that while benefits to the TOML are noted, no comparable analysis of costs is included in the DEIS and thus net benefit or cost is not addressed. I11-29

Nor is sufficient information included to be able to judge the claimed economic benefits noted in the study cited in the DEIS. I11-30

One possible expense that should be included is the expense of switching some current recreational activities to an entirely different area if visitors and I11-31

residents avoid use of the Shady Rest area after project completion due to overall negative effect on the recreational experience. I11-31 cont.

We thank the three agencies and Ormat for the opportunity to comment upon the project's DEIS and trust you will take our comments into consideration. We sincerely hope that a final project will result that increases the local production of carbon-limiting geothermal production and at the same time not permanently and negatively impact the local environment, the recreational experience, or the local economy.

Sincerely,

Malcolm Clark

Malcolm Clark, chair
Range of Light Group
Toiyabe Chapter, Sierra Club
760-924-5639

CENTER *for* BIOLOGICAL DIVERSITY *Because life is good.*

working through science, law and creative media to secure a future for all species, great or small, hovering on the brink of extinction.

VIA ELECTRONIC MAIL AND U.S. MAIL

January 30, 2013

Collin Reinhardt, Project Manager
BLM, Bishop Field Office
351 Pacu Lane, Suite 100
Bishop, CA 93514
Via email: cabipubcom@blm.gov; creinhardt@blm.gov
Attn/Subject: Casa Diablo IV Geothermal Development Project Draft EIS/EIR

Re: Comments on Draft Environmental Impact Statement/Environmental Impact Report for the Casa Diablo IV Geothermal Development Project

Dear Project Manager Reinhardt,

The Center for Biological Diversity ("Center") is a non-profit environmental organization dedicated to the protection of native species and their habitats through science, policy, and environmental law. The Center has over 39,000 members throughout California and the western United States, including members that live in and/or visit the vicinity of the proposed Casa Diablo IV Geothermal Development Project ("proposed project"). These comments are submitted on behalf of our board, staff and members. The Center provides these timely comments on the Draft Environmental Impact Statement / Environmental Impact Report for the Casa Diablo IV Geothermal Development Project ("Draft EIS/EIR" or "DEIS/EIR") in response to the notice (77 Fed. Reg. 68813 (Nov. 16, 2012)) and the notice of an extension of time for comments through January 30, 2013 (78 Fed. Reg. 4144 (Jan. 18, 2013)).

The development of renewable energy generation is a critical component of efforts to reduce greenhouse gas emissions, avoid the worst consequences of global warming, and to assist California in meeting emission reductions standards. The Center strongly supports the development of renewable energy production, and, in particular, supports the generation of electricity from geothermal power where properly designed and sited. However, like any project, any proposed geothermal power project must be thoughtfully planned to minimize impacts to the environment and avoid impacts to sensitive species and habitats to the greatest extent possible through careful siting, planning, and design. Only by maintaining the highest environmental standards with regard to local impacts, and effects on species and habitats, can renewable energy production be truly sustainable.

Unfortunately, the Casa Diablo IV project as proposed will have significant impacts to many environmental resources, and the DEIS/EIR fails to adequately identify and analyze significant impacts and also fails to consider meaningful alternatives that would avoid significant

I12-1

Alaska • Arizona • California • Florida • Minnesota • Nevada • New Mexico • New York • Oregon • Washington • Washington, DC

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impacts and fails to minimize and mitigate any unavoidable impacts. Although the DEIS/EIR purports to review impacts of the proposed project as required under both federal and state laws in a single document, it fails to meet the required standards in many respects. Because the DEIS/EIR is inadequate the agencies cannot adopt any of the action alternatives. Instead, the agencies must either adopt the no action/no project alternative or revise and recirculate the DEIS/EIR including adequate identification and analysis of impacts and a meaningful range of alternatives designed to avoid significant impacts of the project.

I12-1 cont.

The Center joins the comments submitted by Sierra Club on January 30, 2013, as though fully incorporated herein and provides the following additional comments focused primarily on potential impacts to the endangered Owens tui chub (*Siphateles bicolor snyderi = Gila bicolor snyderi*) and its designated critical habitat.

I12-2

1. The Owens tui chub and its designated critical habitat

The Owens tui chub was listed as an endangered species and critical habitat was designated in "Hot Creek, adjacent springs and their outflows in the vicinity of Hot Creek Hatchery, and 50 feet of riparian habitat on all sides of the creek and springs in T3S R28E SW ¼ Sec. 35." 50 Fed. Reg. 31592-31597, 31596 (Aug. 5, 1985). The Owens tui chub is currently restricted to six isolated sites including the Hot Creek Fishery Springs in Mono County. The Owens tui chub includes "the Hot Creek Headwaters population, which is located at the headwaters of Hot Creek above the Hot Creek Fish Hatchery []. The site consists of two springs, AB Spring and CD Spring." FWS (2009) 5-year Review at 5. "The populations at these six sites are genetically pure Owens tui chubs." *Id.* The 5-Year Review also recommended a higher recovery priority for the Owens tui chub because "the taxon is a subspecies that faces a high degree of threat and has a high potential for recovery. The threats that were present when the Owens tui chub was listed are still present with new threats identified. *Id* at 27.

The Owens Basin Wetland and Aquatic Species Recover Plan, FWS (1998), includes the following recommendations for Hot Creek to support recovery of the Owens tui chub and other species:

I12-3

> **Task 2.4. Hot Creek Conservation Area.**
>
> . . .
>
> **Task 2.4.2.** Protect spring discharge. Geothermal development and groundwater pumping in Long Valley may alter aquifer dynamics. Springs supporting Hot Creek should be protected from adverse impacts of decreased discharge, and changes in the thermal and chemical characteristics of water. Monitoring programs should be determine characteristics (temporal, chemical, physical) of natural spring discharge, if spring discharge is being affected, and the location of activities causing adverse effects. Actions should be taken to protect discharge at 1998 levels. Natural spring discharge should continue to be used as the source providing for natural and naturalized aquatic habitats in the Conservation Area.

Recovery Plan at 92-93.

The proposed project DEIS/EIR wholly failed to address the potential impacts to the Owens tui chub, its designated critical habitat, and its recovery needs. I12-3 cont.

2. The Draft EIS/EIR Fails to Identify and Analyze Potentially Significant Impacts to the Owens tui chub and its designated critical habitat

The Draft EIS/EIR fails to properly identify and analyze potentially significant impacts to water resources and in particular to thermal water resources, and impacts to the Owens tui chub and its designated critical habitat. NEPA has "twin aims. First, it places upon [a federal] agency the obligation to consider every significant aspect of the environmental impact of a proposed action. Second, it ensures that the agency will inform the public that it has indeed considered environmental concerns in its decisionmaking process." *Baltimore Gas & Elec. Co. v. Natural Res. Def. Council, Inc.*, 462 U.S. 87, 97 (1983) (citation omitted).

Similarly, the California Legislature enacted CEQA to "[e]nsure that the long-term protection of the environment shall be the guiding criterion in public decisions." *No Oil, Inc. v. City of Los Angeles,* 13 Cal. 3d 68, 74 (1974). The Supreme Court has repeatedly held that CEQA must be interpreted to "afford the fullest possible protection to the environment." *Wildlife Alive v. Chickering*, 18 Cal. 3d 190, 206 (1976) (quotation omitted). CEQA also serves "to demonstrate to an apprehensive citizenry that the agency has, in fact, analyzed and considered the ecological implications of its action." *Laurel Heights Improvement Ass'n v. Regents of Univ. of Cal.* (1988) 47 Cal. 3d 376, 392 ("*Laurel Heights I*"). If CEQA is "scrupulously followed," the public will know the basis for the agency's action and "being duly informed, can respond accordingly to action with which it disagrees." *Id.* Thus, CEQA "protects not only the environment but also informed self-government." *Id.* I12-4

Section 7(a)(2) of the Endangered Species Act ("ESA") requires all federal agencies, in consultation with FWS, to "insure that any action authorized, funded, or carried out by such agency . . . is not likely to jeopardize the continued existence of any endangered species or threatened species." 16 U.S.C. § 1536(a)(2). In order to fulfill the obligations of section 7, "[e]ach Federal agency shall review its actions at the earliest possible time to determine whether any action may affect listed species or critical habitat." 50 C.F.R. § 402.14(a). If the agency determines that its actions "may affect" listed species or critical habitat, formal consultation with FWS is required. *See id.* § 402.14(a). "The threshold for triggering the [ESA] is relatively low; consultation is required whenever a federal action 'may affect listed species or critical habitat.'" *Cal. ex rel. Lockyer v. U.S. Dep't of Agric.*, 575 F.3d at 1018 (quoting 50 C.F.R. 402.14(a)).

The "study area" chosen for analysis failed to include the Hot Creek Fish Hatchery Springs[1] area which will be directly affected by the proposed project's water use. Analyzing too narrow an area of effects fails to comply with the letter or the intent of the environmental review

[1] Somewhat confusingly, in different documents the springs are variously denoted as "Hot Creek Fishery Springs", "Hot Creek Hatchery Springs", "Fish Hatchery Springs", an other similar names.

statutes or the ESA. The ESA includes a broad definition of the term "action." The regulations define "action" in section 7(a)(2) to mean "all activities or programs of any kind authorized, funded, or carried out, in whole or in part, by Federal agencies in the United States." 50 C.F.R. § 402.02 (emphasis added). Applying this definition, the Ninth Circuit has repeatedly construed agency action under the ESA broadly, *see Karuk Tribe of Cal. v. U.S. Forest Serv.,* 681 F.3d 1006, 1020–21 (9th Cir. 2012) (*en banc*), "perhaps even more broadly than 'major federal action' under NEPA," *Cal. ex rel. Lockyer v. U.S. Dep't of Agric.*, 459 F. Supp. 2d 874, 909 (N.D. Cal. 2006) (citing *Marbled Murrelet v. Babbitt*, 83 F.3d 1068, 1075 (9th Cir. 1996)). "There is little doubt that Congress intended agency action to have a broad definition in the ESA, and we have followed the Supreme Court's lead by interpreting its plain meaning in conformance with Congress's clear intent." *Karuk Tribe*, 681 F.3d at 1020. "[C]aution can only be exercised if the agency takes a look at all the possible ramifications of the agency action." *Conner v. Buford*, 848 F.2d 1441, 1453 (9th Cir. 1988) (internal quotations and citations omitted). The ESA regulations further instruct federal agencies to "consider[ ] the effects of the action as a whole," 50 C.F.R. § 402.14(c) (emphasis added), and define the "action area" as "all areas to be affected directly or indirectly by the Federal action and not merely the immediate area involved in the action," *id.* § 402.02. In the present case, the "action" that BLM must evaluate in its "may affect" analysis includes all areas that may be affected by the water withdrawals and impacts to thermal water resources. Similarly, under CEQA, "the term 'project' refers to the underlying activity and not the governmental approval process." *California Unions for Reliable Energy v. Mojave Desert Air Quality Mgmt. Dist.* (2009) 178 Cal. App. 4th 1225, 1241 (*quoting Orinda Ass'n v. Bd. of Supervisors* (1986) 182 Cal. App. 3d 1145, 1171-72). The definition of "project" is "given a broad interpretation in order to maximize protection of the environment." *Lighthouse Field Beach Rescue v. City of Santa Cruz* (2005) 131 Cal. App. 4th 1170, 1180 (internal quotation omitted).

I12-4 cont.

The failure to choose the proper area of analysis is clearly shown here where the DEIS/EIR admits that the Hot Creek Fish Hatchery Springs will experience a decline of approximately 17% but fails to identify and analyze the effects of that decline on the Owens tui chub and its critical habitat stating absurdly that "[t]here is no Owens tui chub habitat available in the study area" (DEIS/EIR at 4.4-13), and then attempting to justify why predicted declines in the Hot Creek Fish Hatchery Springs will not impact the fish. Conclusory statements cannot substitute for analysis and the agencies cannot utilize an overly-restrictive "study area" to avoid identifying and analyzing impacts to listed species and critical habitats. The "action area" for analysis for this proposed project must include "all areas to be affected directly or indirectly by the Federal action and not merely the immediate area involved in the action," 50 C.F.R. § 402.02. The Owens tui chub designated habitat at Hot Creek clearly is within the action area and the impacts of the proposed project must be evaluated under the ESA as well as NEPA and CEQA; therefore additional environmental review is needed. The overly narrow project area studied may also have lead to an underestimation of impacts to other special status species that are affected by impacts to water resources including the Sierra Nevada (Mountain) yellow-legged frog (*Rana muscosa*), Yosemite toad (*Anaxyrus canorus*), and both Lahontan cutthroat trout and Piute cutthroat trout; on this basis as well additional environmental review is needed.

I12-5

Appendix D to the DEIS/EIR, a Geologic and Geothermal Technical Report, states: "The potential impact at the Fish Hatchery Springs could be ~ 17% decline in thermal water input." Appx. D at D-46. The attempts to minimize potential import of this finding by asserting: "The thermal water fraction of the Hatchery springs is a very small part of the total flow and spring temperatures have previously been shown to be primarily dependent on seasonal fluctuations in precipitation and not the thermal component of flow (Sorey and Sullivan, 2006)." *Id.* (*But see,* discussion below regarding USGS data that shows declines in thermal spring output beyond seasonal fluctuations.) Building on the statements in Appendix D and ignoring the sensitivity of Owens tui chub to thermal changes at Hot Creek Fish Hatchery Springs, the DEIS/EIR then repeats these statements and provides conclusions in lieu of any actual analysis. For example:

> Although the CD-IV project is forecast to reduce the thermal outflow to Hatchery Springs by about 17 percent, the thermal water fraction is a very small part (less than 5 percent) of the total flow so the forecast impact to the combined cold and thermal discharge at the springs is forecast to be reduced by less than 1 percent, which is not likely to be measureable relative to climatic effects. In addition, conductive buffering of the temperature would minimize potential temperature changes.

I12-6

DEIS/EIR at 4.4-13.

Nonetheless, the DEIS/EIR does reluctantly conclude: "Based on this assessment there would be limited potential for adverse impacts on the Owens tui chub or its critical habitat as a result of operation of the Proposed Action." DEIS/EIR at 4.4-14. Even, this weak finding is nonetheless sufficient to trigger a "may affect" determination and therefore consultation is required under the ESA. The "may affect" threshold is low; "[a]ny possible effect, whether beneficial, benign, adverse, or of an undetermined character, triggers the formal consultation requirement." 51 Fed. Reg. 19,926, 19,949 (June 3, 1986) (emphasis added); *see also Karuk Tribe*, 681 F.3d at 1027 ("The Secretaries of Commerce and the Interior have explained that "[t]he threshold for formal consultation must be set sufficiently low to allow Federal agencies to satisfy their duty to 'insure' that their actions do not jeopardize listed species or adversely modify critical habitat."); *W. Watersheds Project v. Kraayenbrink,* 632 F.3d 472, 496 (9th Cir. 2011).

Further, the DEIS/EIR and the appendices do not appear to have utilized the most recent data from the Long Valley Hydrologic Advisory Committee ("LVHAC") Hydrologic Monitoring Data. The data reports from February and August 2012 clearly show that there has been a decrease in the output of thermal springs in this area at AB and CD springs (beyond seasonal fluxuations) which are associated with the Hot Creek Fishery Springs and Owens tui chub habitat. (*See, e.g.,* LVHAC February 2012 report at 8 and 9 showing thermal water discharge declines; August 2012 report at 8 (same): attached hereto as Exhibits 1 and 2) Additional water pumping from the system and particularly at the proposed wells sites to the east (55-32 and 65-32), could significantly increase the thermal decline and impact the Owens tui chub. Indeed, the likely 17% decline in thermal output that was identified may be very significant to the species and must be analyzed in more detail under NEPA and CEQA as well as in the context of an ESA consultation.

I12-7

I12-8

The agencies should have also consulted with the LVHAC for their expertise as part of the DEIS/EIR process. Instead, the DEIS/EIR defers even consulting with the LVHAC on the potential need for additional monitoring or a new monitoring plan until after the decision is made. "If the CD-IV Project were approved, the LVHAC would evaluate expansion of the hydrologic monitoring program in Long Valley, which would be incorporated as a condition of approval for the project." DEIS/EIR at 3.7-19. Deferring the needed analysis as well as development of needed monitoring regimes until after a decision is made is contrary to the purpose of environmental review. More robust monitoring will certainly be needed if the proposed project is approved an increasing amounts of water are extracted from the system. For example, one or more new thermal monitoring wells may be needed between the well sites and Hot Creek Fishery or Hatchery Springs area in order to detect reductions in thermal flow as early as possible, particularly if the well sites on the east are approved (which they should not be). Due to the lag in these systems even after pumping ceases and the perilous status of the Owens tui chub, early detection is critical to ensure against catastrophic loss to the species. I12-9 I12-10

The DEIS/EIR also fails to address cumulative impacts to thermal water resources and the Owens tui chub from this and other "past, present, and reasonably foreseeable future actions regardless of what agency... or person undertakes such actions." 40 CFR § 1508.7 It is inappropriate to "defer consideration of cumulative impacts to a future date. 'NEPA requires consideration of the potential impacts of an action *before* the action takes place.'" *Neighbors*, 137 F.3d at 1380 *quoting City of Tenakee Springs v. Clough*, 915 F.2d 1308, 1313 (9th Cir. 1990) (emphasis in original). Indeed, the conclusory statement in the DEIS/EIR that "the forecast impact to the combined cold and thermal discharge at the springs is forecast to be reduced by less than 1 percent, which is not likely to be measureable relative to climatic effects" (DEIS/EIR at 4.4-13), is both unclear (does this refer to climate change or other climatic factors?) and completely fails to address the past impacts to thermal water resources from the existing geothermal plants (as discussed above) in a meaningful cumulative impacts analysis. A true cumulative impacts analysis is needed (not merely a conclusory statement) regarding impacts to thermal water resources. I12-11

The DEIS/EIR also attempts to rely on plans that have not yet been developed and a commitment to continue the mitigation measures put in place for the existing projects to reduce or minimize the impact from the new proposed project that will vastly increase the water extraction, is wholly inadequate (DEIS/EIR at 4.4-14), and does not provide the needed avoidance, minimization and mitigation measure for this proposed project. I12-12

3. The DEIS/EIR Fails To Properly Address Forest Plan Standards, Guidelines, Goals and Objectives

The BLM has also failed adequately address the Sierra Nevada Forest Plan Amendments standards and guidelines for the protection of aquatic, riparian and meadow ecosystems and associated species in the DEIS/EIR. The SNFPA "Aquatic Management Strategy" and goals and objectives include: I12-13

> **Riparian Conservation Objective #2**: *Maintain or restore*: (1) the geomorphic and biological characteristics of special aquatic features, including lakes, meadows, bogs, fens, wetlands, vernal pools, springs; (2) streams, including in stream flows; and (3) hydrologic connectivity both within and between watersheds to provide for the habitat needs of aquatic-dependent species."
>
> . . .
>
> **Riparian Conservation Objective #5**: *Preserve, restore, or enhance* special aquatic features, such as meadows, lakes, ponds, bogs, fens, and wetlands, to provide the ecological conditions and processes needed to recover or enhance the viability of species that rely on these areas.

I12-13 cont.

SNFPA ROD at 33 (emphasis added). Allowing additional declines in thermal water resources critical for the Owens tui chub directly conflicts with the goal to "maintain or restore . . . springs" and to "preserve, restore, or enhance special aquatic features . . . needed to recover or enhance the viability of species that rely on these areas." The DEIS/EIR also fails to address other critical SNFPA goals:

> • **Species Viability**: Maintain and restore habitat to support viable populations of native and desired non-native plant, invertebrate, and vertebrate riparian-dependent species. Prevent new introductions of invasive species.
>
> . . .
>
> • **Special Habitats**: Maintain and restore the distribution and health of biotic communities in special aquatic habitats (such as springs, seeps, vernal pools, fens, bogs, and marshes) to perpetuate their unique functions and biological diversity.

I12-14

SNFPA ROD at 32. *Center for Sierra Nevada Conservation, et al. v. USFS*, 832 F. Supp. 2d 1138, 1166-1169 (E.D. Cal. 2011) (holding that the Forest Service conclusion that its actions complied with the Riparian Conservation Objectives was arbitrary and capricious). These goals must be considered in evaluating the impacts to thermal water resources on the Owens tui chub as well as the impacts to all water resources which may affect other special status species. On this basis as well, additional environmental review is needed.

4. The DEIS/EIR Fails To Analyze A Range of Alternatives That Would Avoid Significant Impacts and Mitigation Measures

Inevitably, because the agencies failed to properly identify and analyze significant impacts to thermal water resources and the Owens tui chub and its critical habitat, none of the alternatives were designed to avoid potentially significant impacts to thermal water resources and to the Owens tui chub and its designated critical habitat. The proposed project and all of the alternatives evaluated include the same amount of water pumping and the same layout of water wells, including two proposed wells on the east side of the valley in close proximity to the Hot Creek Springs. This is unacceptable. At minimum, the DEIS/EIR needs to evaluate a reduced water alternative either with reduced output or utilizing technologies that reduce water use in production and cooling. In addition, before any project approval, there must be strict monitoring protocols in place and clear triggers for needed mitigation measures to protect the Owens tui

I12-15

I12-16

chub and other resources. If the proposed project is approved, mitigation measures must also be adopted that will support recovery of the Owens tui chub. I12-16 cont.

Pursuant to CEQA, the "policy of the state" is that projects with significant environmental impacts may not be approved "if there are feasible alternatives or feasible mitigation measures available which would substantially lessen the significant environmental effects..." Pub. Res. Code § 21002; CEQA Guidelines § 15021(a)(2). A proposed project should not be approved if environmentally superior alternatives exist "even if these alternatives would impede to some degree the attainment of the project objectives, or would be more costly." CEQA Guidelines §§ 15021(a)(2), 15126.6; Pub. Res. Code § 21002. A proposed project must be rejected if an alternative available for consideration would accomplish "most [not all] of the basic objectives of the project and could avoid or substantially lessen one or more of the significant effects." CEQA Guidelines § 15126.6(c).

Accordingly, the environmental review documents must consider a range of alternatives that would achieve the basic objectives of the project while avoiding or substantially lessening significant environmental effects, and it is essential that the "EIR shall include sufficient information about each alternative to allow meaningful evaluation, analysis, and comparison with the proposed project." CEQA Guidelines § 15126.6(d). In this case, alternative sites for the wells and at least one alternative that reduced water impacts should also have been considered to substantially lessen the significant impacts of the project. Guidelines Section 15126.6(f)(2). *See Citizens of Goleta Valley v County of Santa Barbara* (1988) 197 Cal.App.3d 1167, 1178; *Save Round Valley Alliance v. County of Inyo* (2007) 157 Cal.App.4th 1437, 1456 (whether an alternative site may be feasible even where it requires a change in land use designation; to determine feasibility requires detailed analysis of the alternatives; and even if an alternative is less profitable than the project as proposed it may still be a feasible alternative). The environmental review must also analyze any proposed mitigation measures and their likely efficacy, regardless of where those mitigation measures occur. CEQA Guidelines § 15126.4(a)(1)(D) ("If a mitigation measure would cause one or more significant effects in addition to those that would be caused by the project as proposed, the effects of the mitigation measures *shall* be discussed . . ." emphasis added); *Save Our Peninsula Comm. v. Monterey Board of Supervisors* (2001) 87 Cal.App.4th 99, 131. I12-17

NEPA similarly requires that a range of meaningful alternatives be explored in the environmental review process. 42 U.S.C. §§ 4332(C)(iii),(E). The agency must "study, develop, and describe appropriate alternatives to recommend courses of action in any proposal which involves unresolved conflicts concerning alternative uses of available resources." 42 U.S.C. § 4332(2)(E). The discussion of alternatives is at "the heart" of the NEPA process, and is intended to provide a "clear basis for choice among options by the decisionmaker and the public." 40 C.F.R. §1502.14; *Idaho Sporting Congress*, 222 F.3d at 567 (compliance with NEPA's procedures "is not an end in itself . . . [but] it is through NEPA's action forcing procedures that the sweeping policy goals announced in § 101 of NEPA are realized.") (internal citations omitted). NEPA's regulations and Ninth Circuit case law require the agency to "rigorously explore" and objectively evaluate "all reasonable alternatives." 40 C.F.R. § 1502.14(a) (emphasis added); *Envtl. Prot. Info. Ctr. v. U.S. Forest Serv.*, 234 Fed. Appx. 440, 442 (9th Cir. 2007).

"The purpose of NEPA's alternatives requirement is to ensure agencies do not undertake projects "without intense consideration of other more ecologically sound courses of action, including shelving the entire project, or of accomplishing the same result by entirely different means." *Envtl. Defense Fund, Inc. v. U.S. Army Corps of Engrs.*, 492 F.2d 1123, 1135 (5th Cir. 1974). An agency will be found in compliance with NEPA only when "all reasonable alternatives have been considered and an appropriate explanation is provided as to why an alternative was eliminated." *Native Ecosystems Council v. U.S. Forest Serv.,* 428 F.3d 1233, 1246 (9th Cir. 2005); *Bob Marshall Alliance v. Hodel*, 852 F.2d 1223, 1228-1229 (9th Cir. 1988). The courts, in the Ninth Circuit as elsewhere, have consistently held that an agency's failure to consider a reasonable alternative is fatal to an agency's NEPA analysis. *See, e.g., Idaho Conserv. League v. Mumma*, 956 F.2d 1508, 1519-20 (9th Cir. 1992) ("The existence of a viable, but unexamined alternative renders an environmental impact statement inadequate."). I12-17 cont.

If the agency rejects an alternative from consideration, it must explain why a particular option is not feasible and was therefore eliminated from further consideration. 40 C.F.R. § 1502.14(a). The courts will scrutinize this explanation to ensure that the reasons given are adequately supported by the record. *See Muckleshoot Indian Tribe v. U.S. Forest Service*, 177 F.3d 800, 813-15 (9th Cir. 1999); *Idaho Conserv. League*, 956 F.2d at 1522 (while agencies can use criteria to determine which options to fully evaluate, those criteria are subject to judicial review); *Citizens for a Better Henderson*, 768 F.2d at 1057. Here, BLM too narrowly construed the project purpose and need such that the DEIS/EIR did not consider an adequate range of alternatives to the proposed project and improperly rejected the only alternative which may have reduced impacts to water resources, thermal springs and the Owens tui chub – the Reduced Power Alternative.

The agencies also failed to address mitigation as required under NEPA. Even in those cases where the extent of impacts may be somewhat uncertain due to the complexity of the issues, the agency is not relieved of its responsibility under NEPA to discuss mitigation of reasonably likely impacts at the outset. Even if the discussion may of necessity be tentative or contingent, NEPA requires that the agency provide some information regarding whether potentially significant impacts could be avoided. *South Fork Band Council of Western Shoshone v. DOI*, 588 F.3d 718, 727 (9th Cir. 2009). The DEIS/EIR here fails to do so. I12-18

The DEIS/EIR also fails to discuss any mitigation measures for impacts to thermal water resources and Owens tui chub habitat or even the need for additional monitoring of I12-19

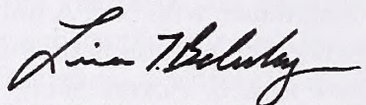
5. Conclusion

The failure to adequately addressed impacts to thermal water resources and the Owens tui chub and its critical habitat renders the DEIS/EIR inadequate under NEPA as does the BLM's failure to provide any alternative that would ensure conservation of water resources and survival and recovery of the Owens tui chub is prioritized. I12-20

Given the gross shortcomings of the Draft EIS/EIR, a revised Draft EIS/EIR is clearly needed and must be circulated to the public or the no action/no project alternative must be

selected by the agencies. Thank you for considering these comments on the Draft EIS/EIR. The Center looks forward to reviewing a revised Draft EIS/EIR. I12-20 cont.

Sincerely,



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San Francisco, CA 94104
(415) 632-5307
Fax: (415) 436-9683
lbelenky@biologicaldiversity.org

Attachments:

Exhibit 1: USGS, February 13, 2012, Long Valley Hydrologic Advisory Committee, Hydrologic Monitoring Data For the Period Ending December 2011

Exhibit 2: USGS, August 28, 2012, Long Valley Hydrologic Advisory Committee, Hydrologic Monitoring Data, through July 2012

cc:

U.S. Fish and Wildlife Service; Brian Croft, brian_croft@fws.gov

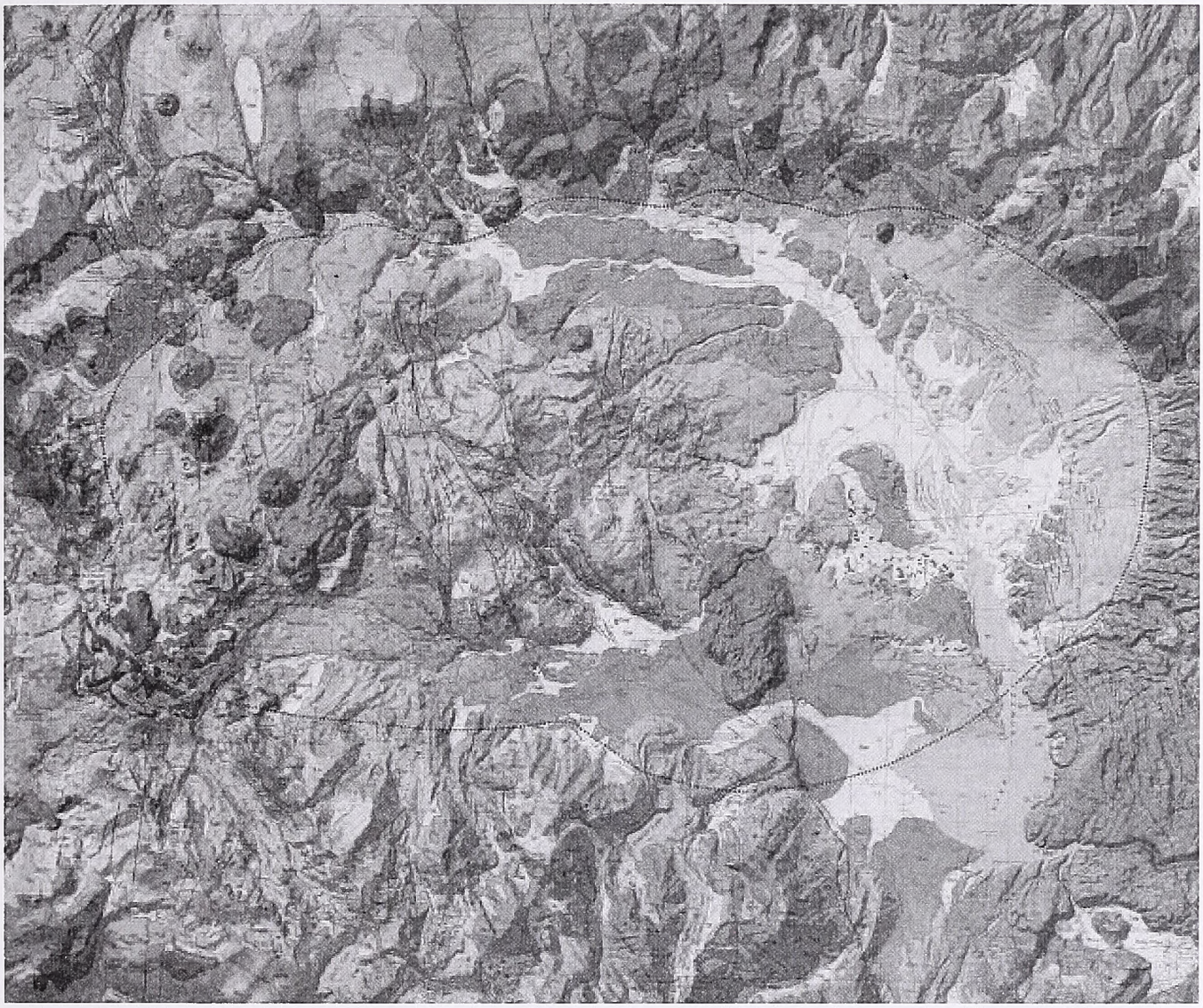
U.S. EPA, Tom Plenys, Plenys.Thomas@epa.gov

California Department of Fish and Wildlife:

Kevin Hunting, Chief Deputy Director, khunting@dfg.ca.gov

Steve Parmenter, Staff Environmental Scientist, steve.parmenter@wildlife.ca.gov

Long Valley Hydrologic Advisory Committe
Hydrologic Monitoring Data



Unpublished provisional U.S. Geological Survey Data
through July 2012
Submitted by J.F. Howle and Kevin Bazar
Prepared August 28, 2012

LIST OF DATA

GROUND-WATER LEVELS

Daily Mean Water Levels

Hydrograph for well CH-10B 1985 through mid-August 2012.
Hydrograph for well LV-19 from late 2009 through mid-August 2012.

FISH HATCHERY DATA – 1988 through July 2012

Measured Values for sites FHAB, FHCD, FH23

Discharge – Daily mean values
Water temperature – Daily mean values

Calculated Values

Thermal water discharge estimate – AB and CD
Thermal water as percent – AB and CD
Total and thermal water discharge -- AB and CD combined

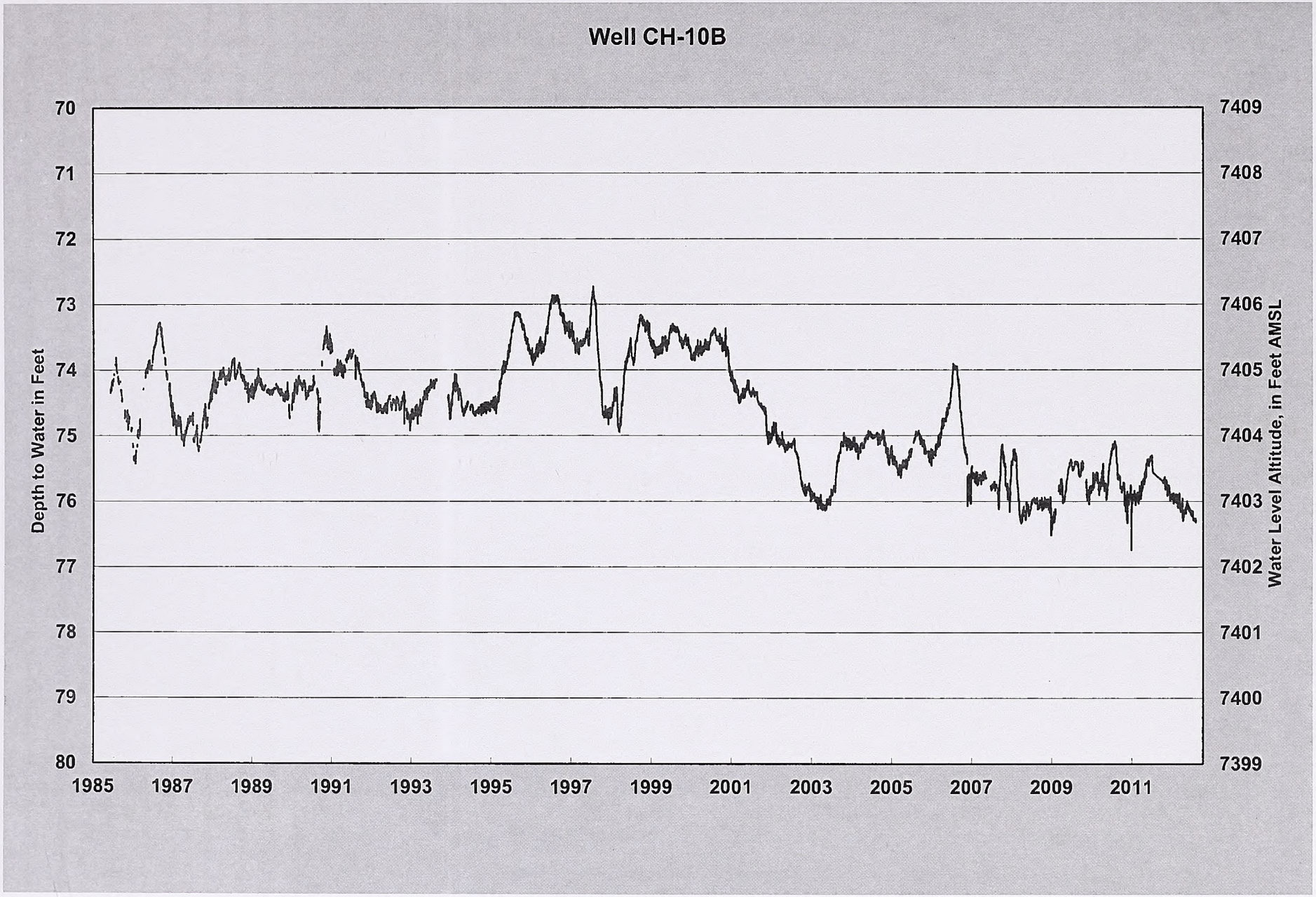
HOT CREEK DATA

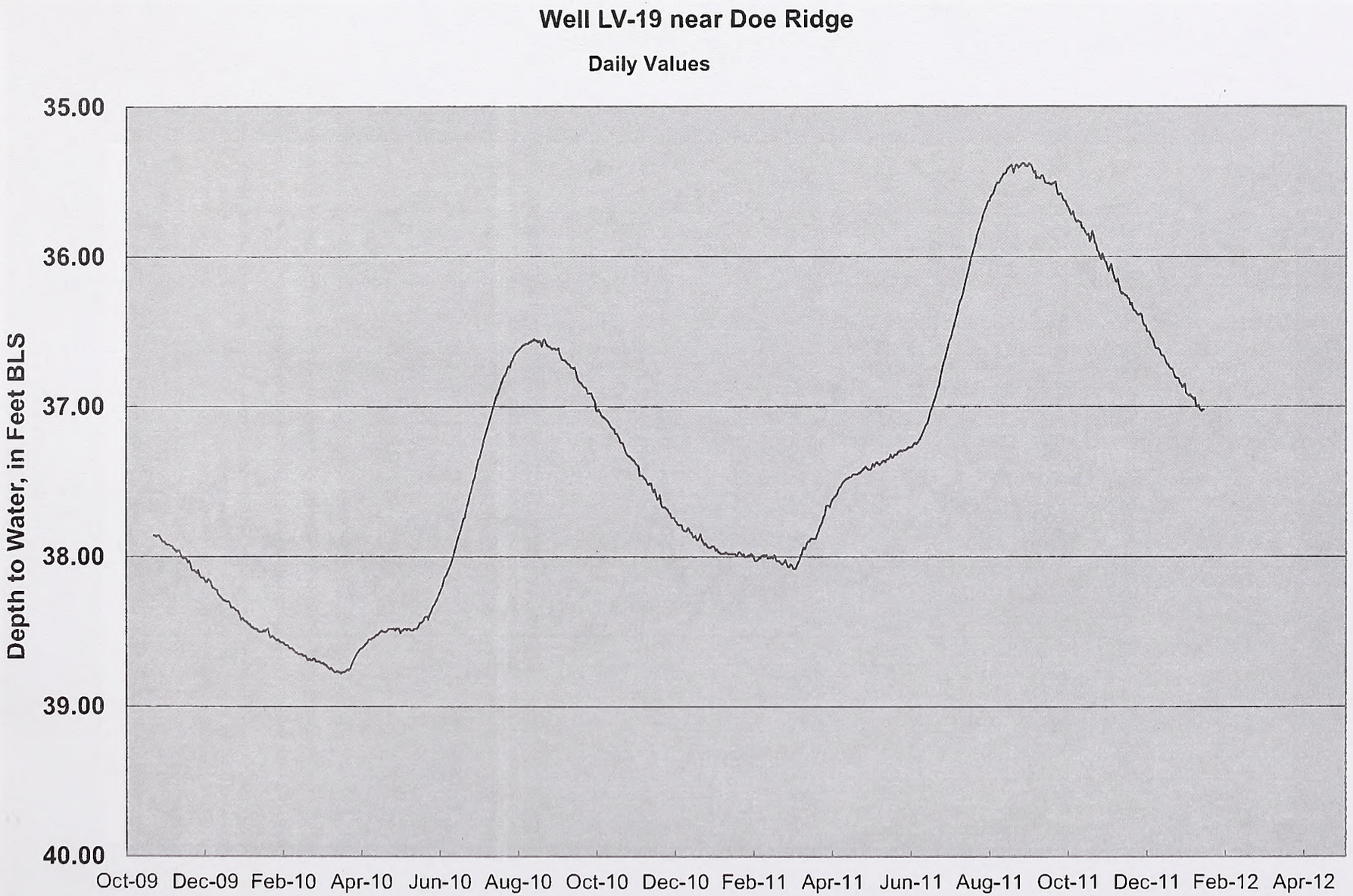
Hot Creek flume daily mean discharge 1983 through mid-August 2012
Graph of estimated thermal water discharge 1988 through April 2012

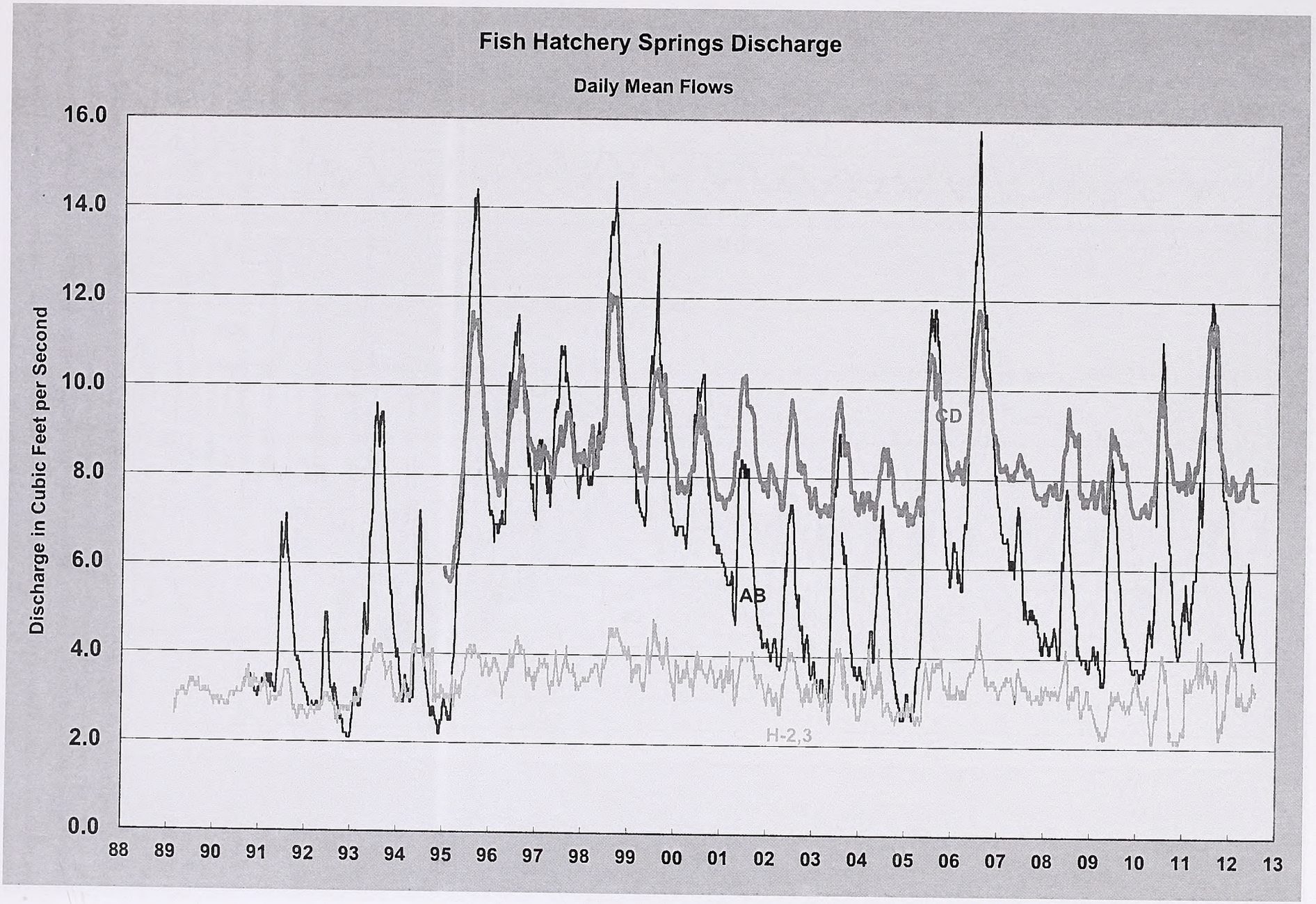
PRECIPITATION

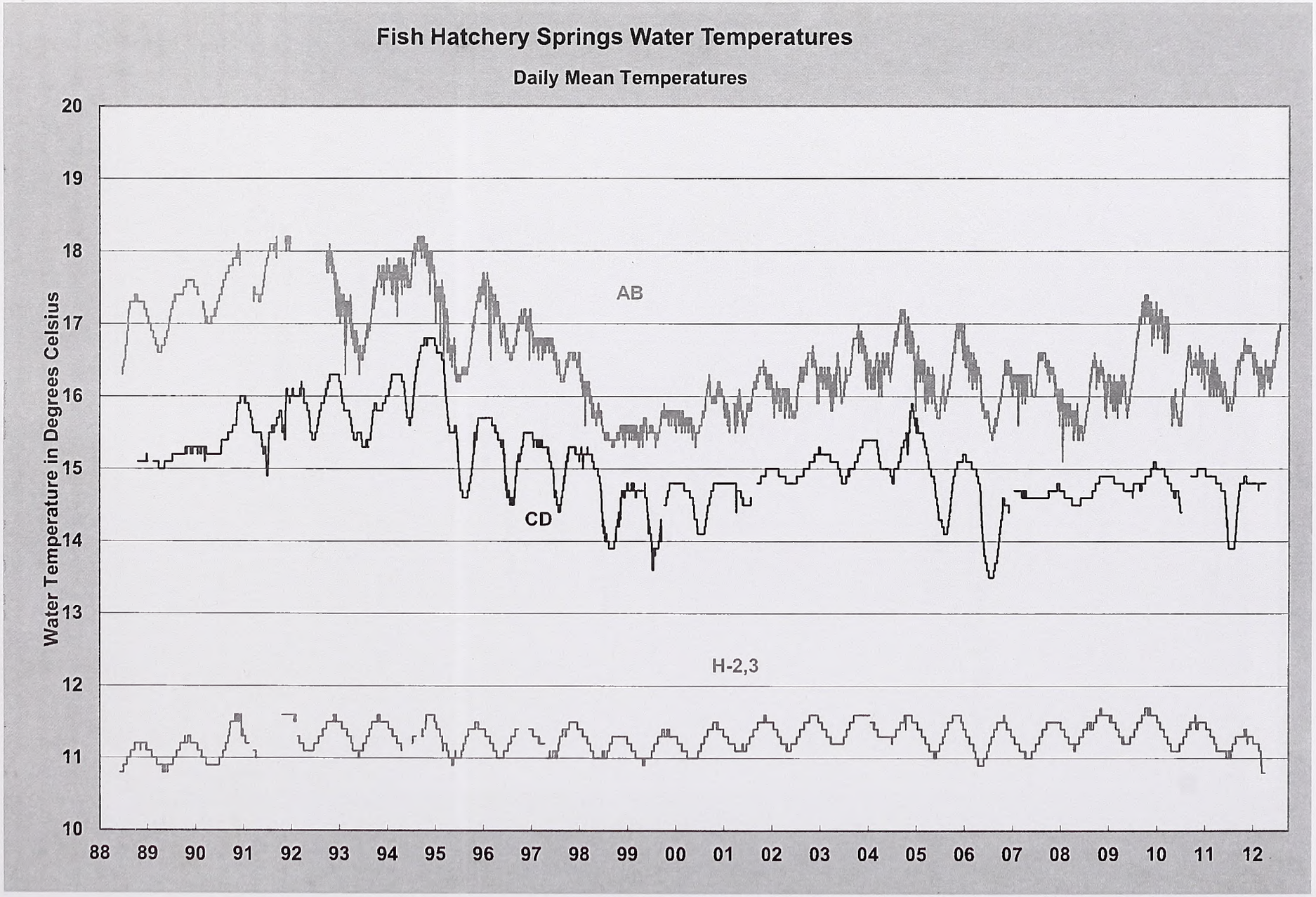
Precipitation measured at Mammoth Ranger Station 1982 through Jun 2012

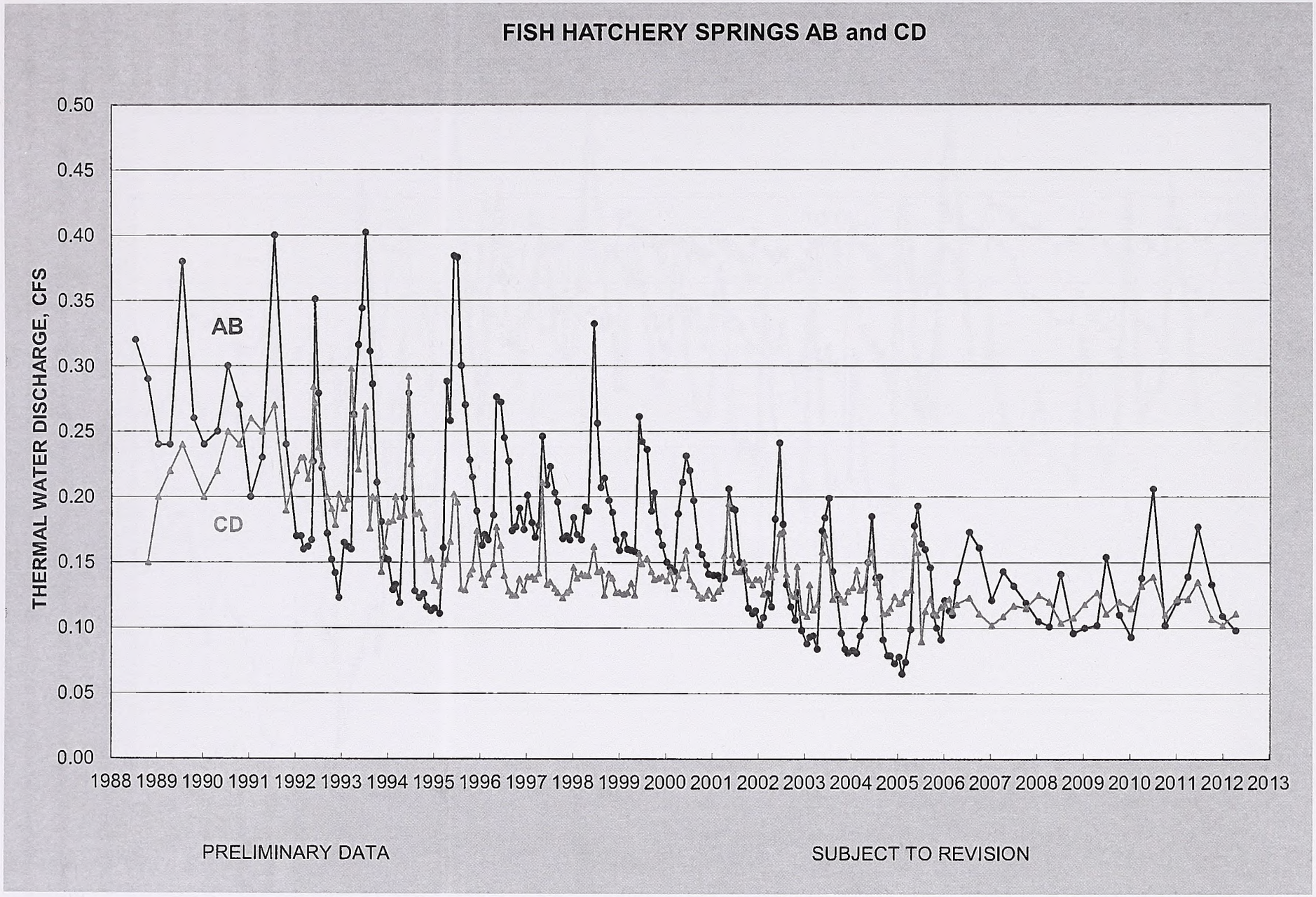
Cover Image: Roy Bailey's 1989 geologic map of the Long Valley Caldera.


Well CH-10B
Depth to Water in Feet
70
71
72
73
74
75
76
77
78
79
80
Water Level Altitude, in Feet AMSL
7409
7408
7407
7406
7405
7404
7403
7402
7401
7400
7399
1985
1987
1989
1991
1993
1995
1997
1999
2001
2003
2005
2007
2009
2011


Well LV-19 near Doe Ridge
Daily Values
Depth to Water, in Feet BLS
35.00
36.00
37.00
38.00
39.00
40.00
Oct-09
Dec-09
Feb-10
Apr-10
Jun-10
Aug-10
Oct-10
Dec-10
Feb-11
Apr-11
Jun-11
Aug-11
Oct-11
Dec-11
Feb-12
Apr-12

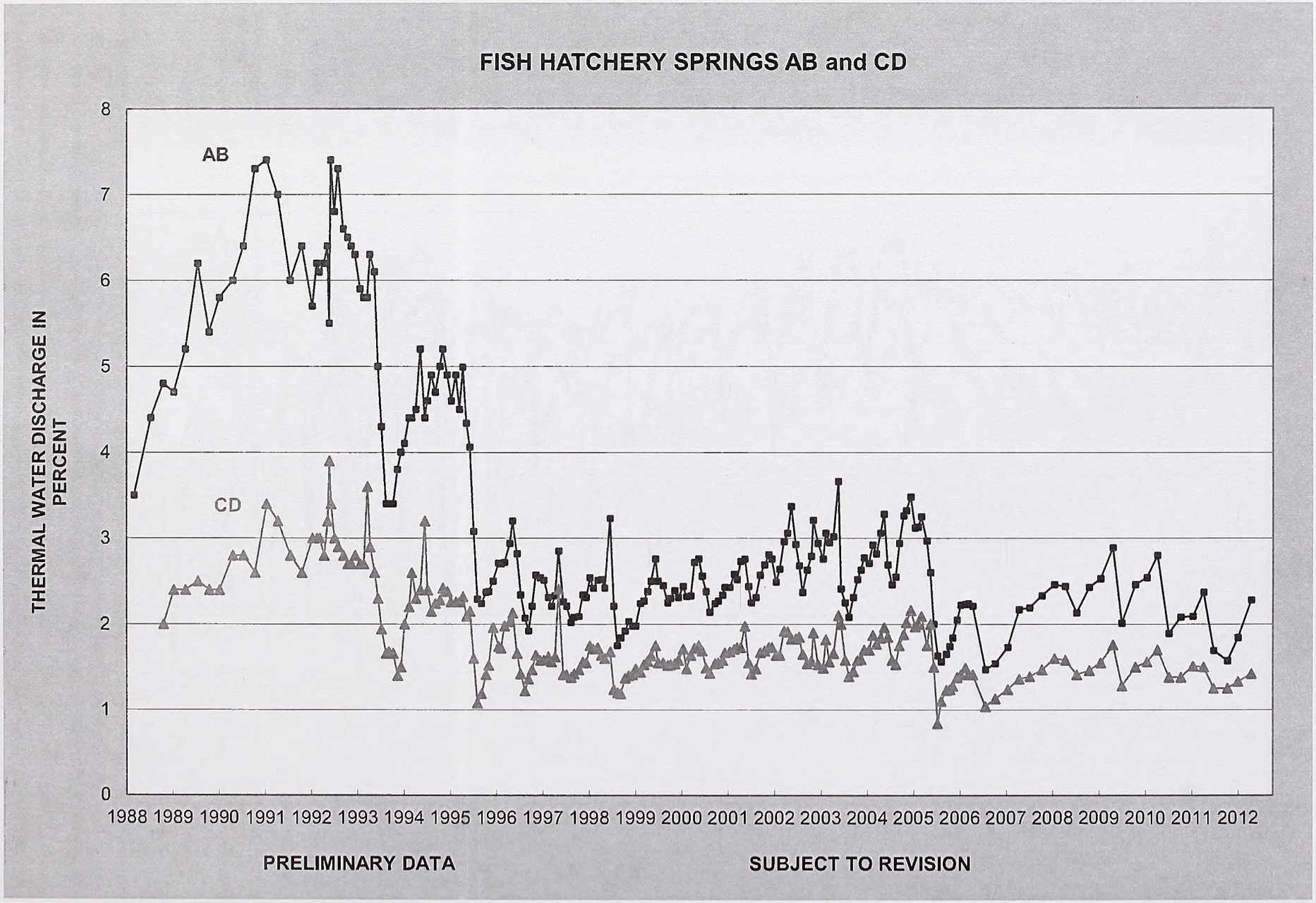

Fish Hatchery Springs Discharge
Daily Mean Flows
Discharge in Cubic Feet per Second
16.0
14.0
12.0
10.0
8.0
6.0
4.0
2.0
0.0
88 89 90 91 92 93 94 95 96 97 98 99 00 01 02 03 04 05 06 07 08 09 10 11 12 13
CD
AB
H-2,3

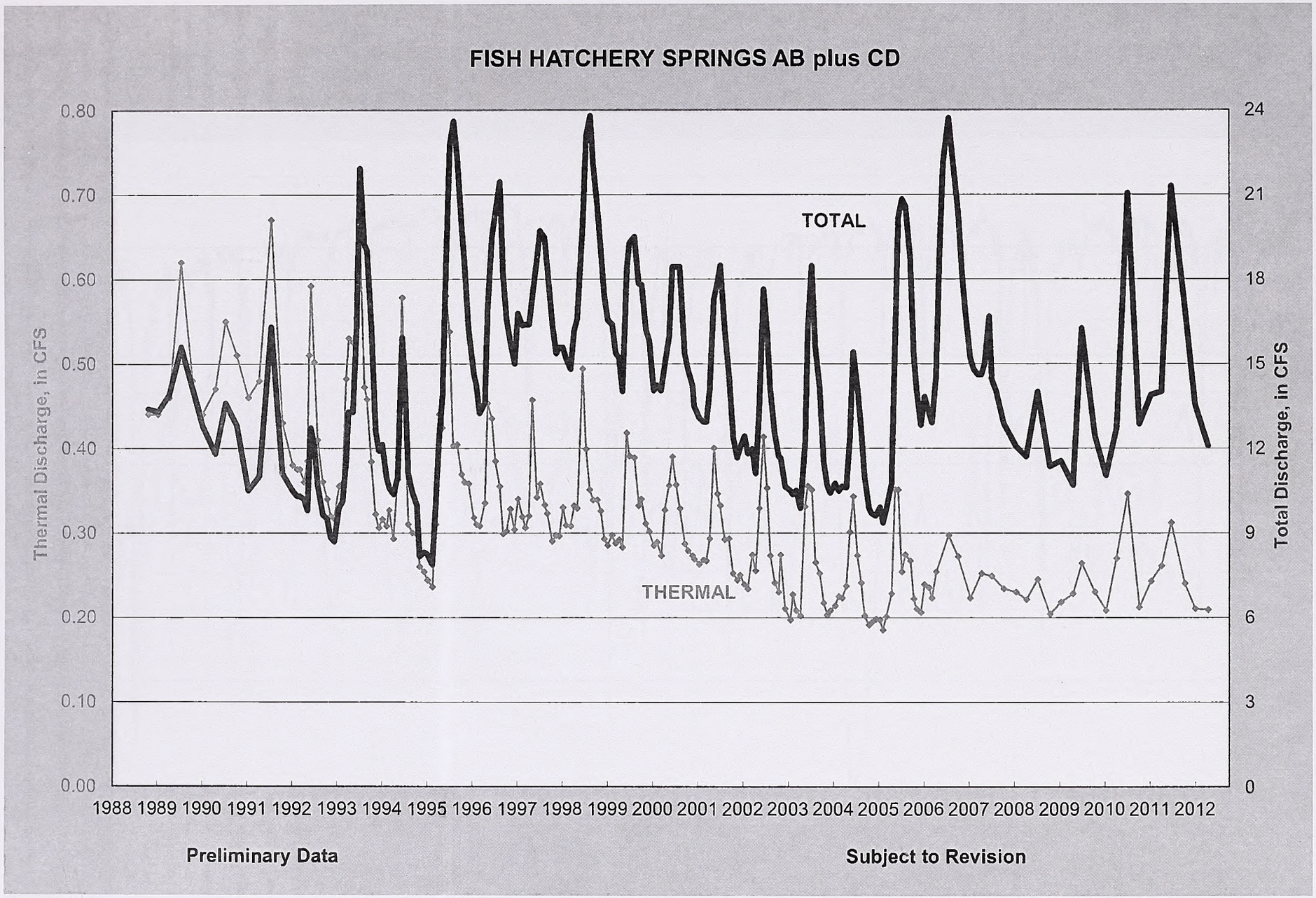

Fish Hatchery Springs Water Temperatures
Daily Mean Temperatures
Water Temperature in Degrees Celsius
20
19
18
17
16
15
14
13
12
11
10
AB
CD
H-2,3
88
89
90
91
92
93
94
95
96
97
98
99
00
01
02
03
04
05
06
07
08
09
10
11
12

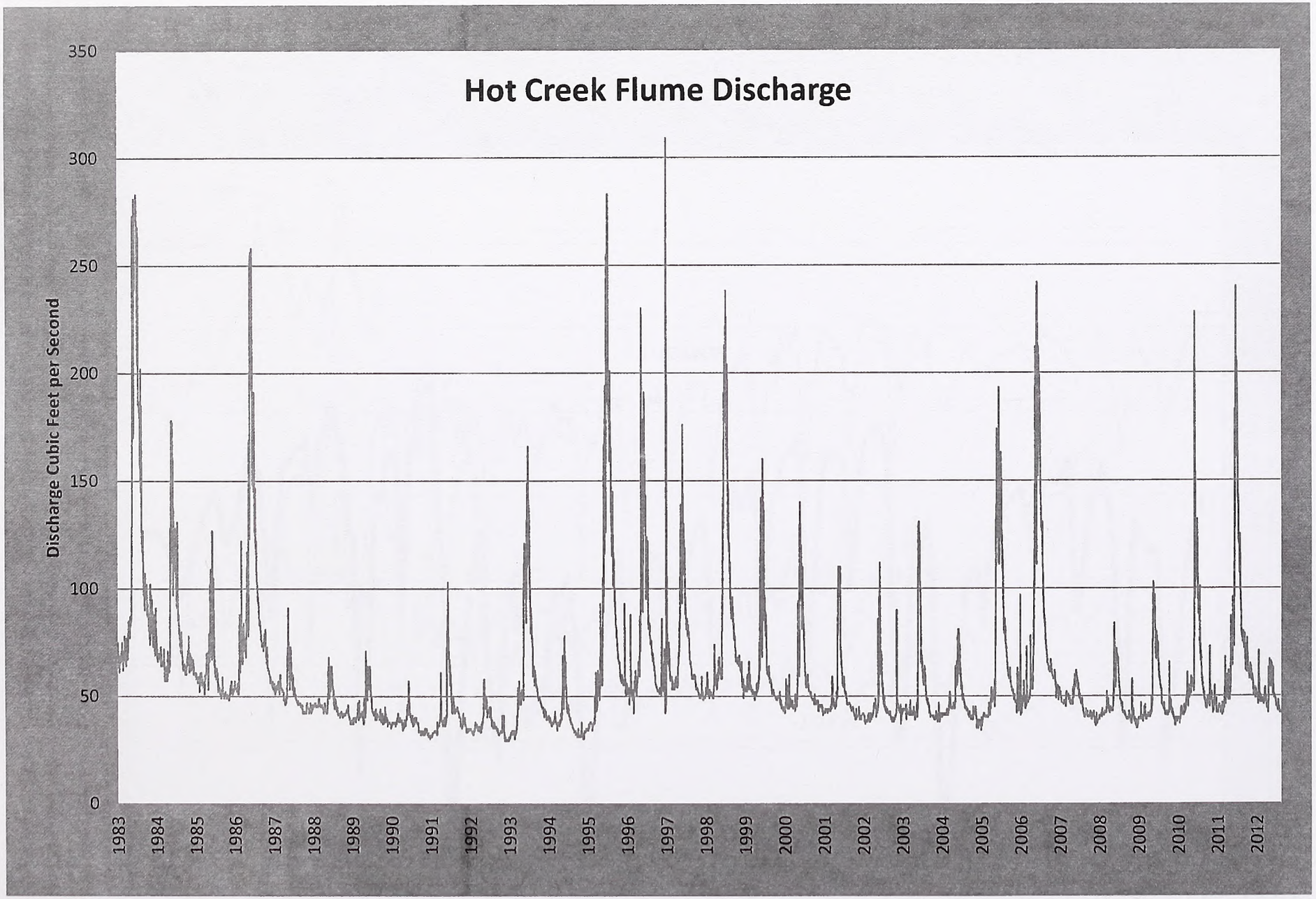


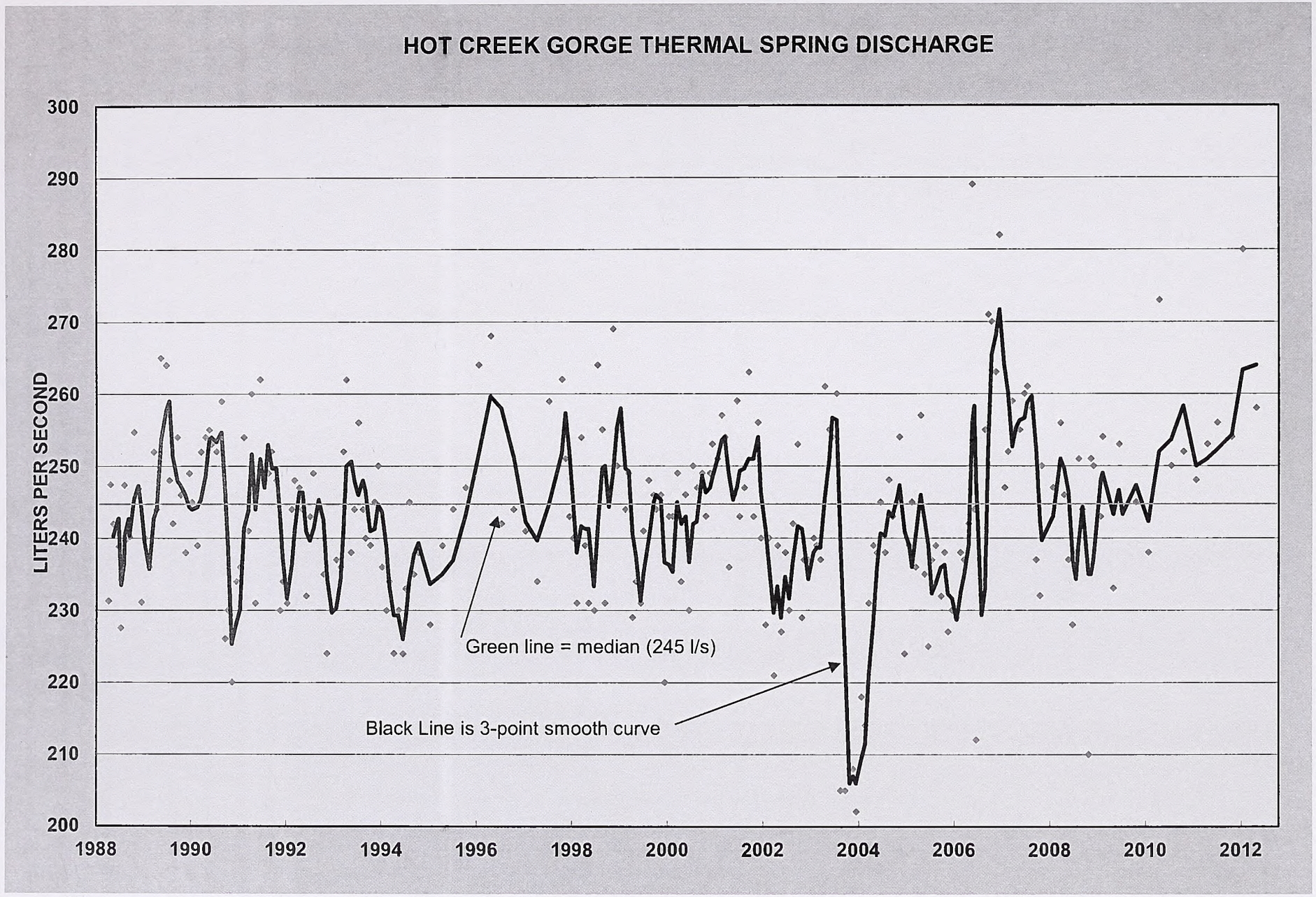
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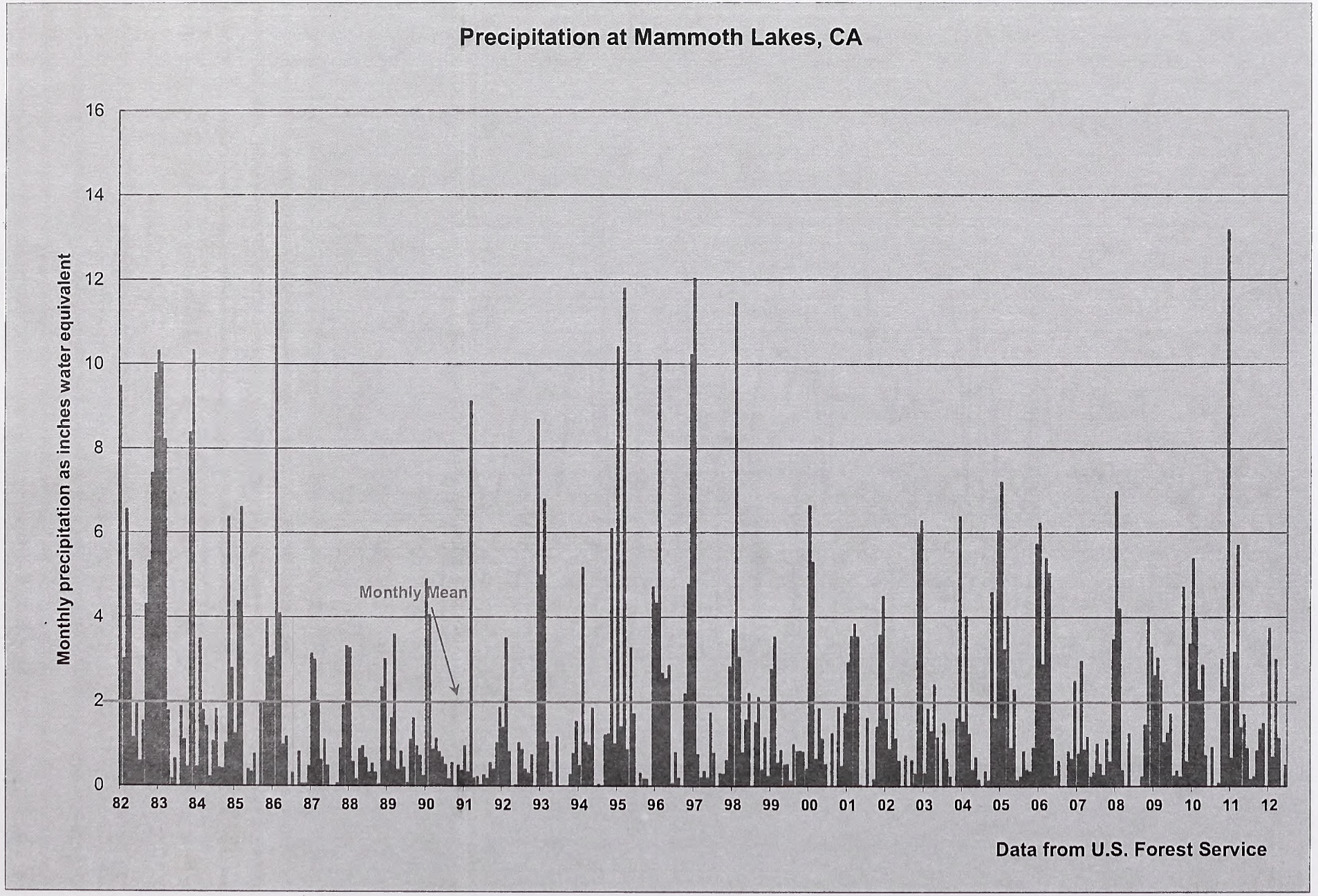

FISH HATCHERY SPRINGS AB and CD
THERMAL WATER DISCHARGE IN PERCENT
AB
CD
0
1
2
3
4
5
6
7
8
1988 1989 1990 1991 1992 1993 1994 1995 1996 1997 1998 1999 2000 2001 2002 2003 2004 2005 2006 2007 2008 2009 2010 2011 2012
PRELIMINARY DATA
SUBJECT TO REVISION


FISH HATCHERY SPRINGS AB plus CD
Thermal Discharge, in CFS
Total Discharge, in CFS
0.80
0.70
0.60
0.50
0.40
0.30
0.20
0.10
0.00
24
21
18
15
12
9
6
3
0
TOTAL
THERMAL
1988 1989 1990 1991 1992 1993 1994 1995 1996 1997 1998 1999 2000 2001 2002 2003 2004 2005 2006 2007 2008 2009 2010 2011 2012
Preliminary Data
Subject to Revision


Hot Creek Flume Discharge
Discharge Cubic Feet per Second
350
300
250
200
150
100
50
0
1983
1984
1985
1986
1987
1988
1989
1990
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
2007
2008
2009
2010
2011
2012

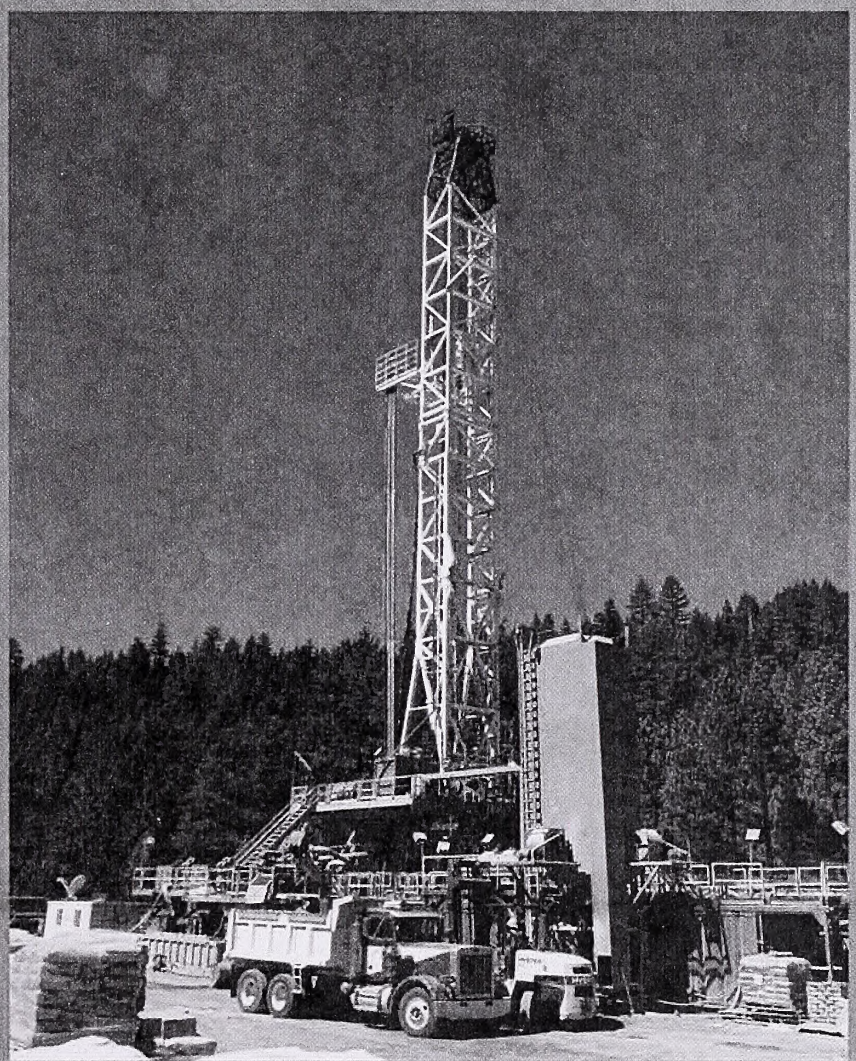


PRELIMINARY DATA SUBJECT TO REVISION


Precipitation at Mammoth Lakes, CA
Monthly precipitation as inches water equivalent
16
14
12
10
8
6
4
2
0
Monthly Mean
82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 00 01 02 03 04 05 06 07 08 09 10 11 12
Data from U.S. Forest Service

Long Valley Hydrologic Advisory Committee Hydrologic Monitoring Data

For the Period Ending December 2011



Unpublished provisional U.S. Geological Survey Data
Submitted by J.F. Howle, C.D. Farrar, and Kevin Bazar
Prepared February 13, 2012

LIST OF DATA

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Daily Mean Water Levels

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Hydrograph for well LV-19.

FISH HATCHERY DATA – 1988 through 2011

Measured Values for sites FHAB, FHCD, FH23

Discharge – Daily mean values
Water temperature – Daily mean values

Calculated Values

Thermal water discharge estimate – AB and CD
Thermal water as percent – AB and CD
Total and thermal water discharge -- AB and CD combined

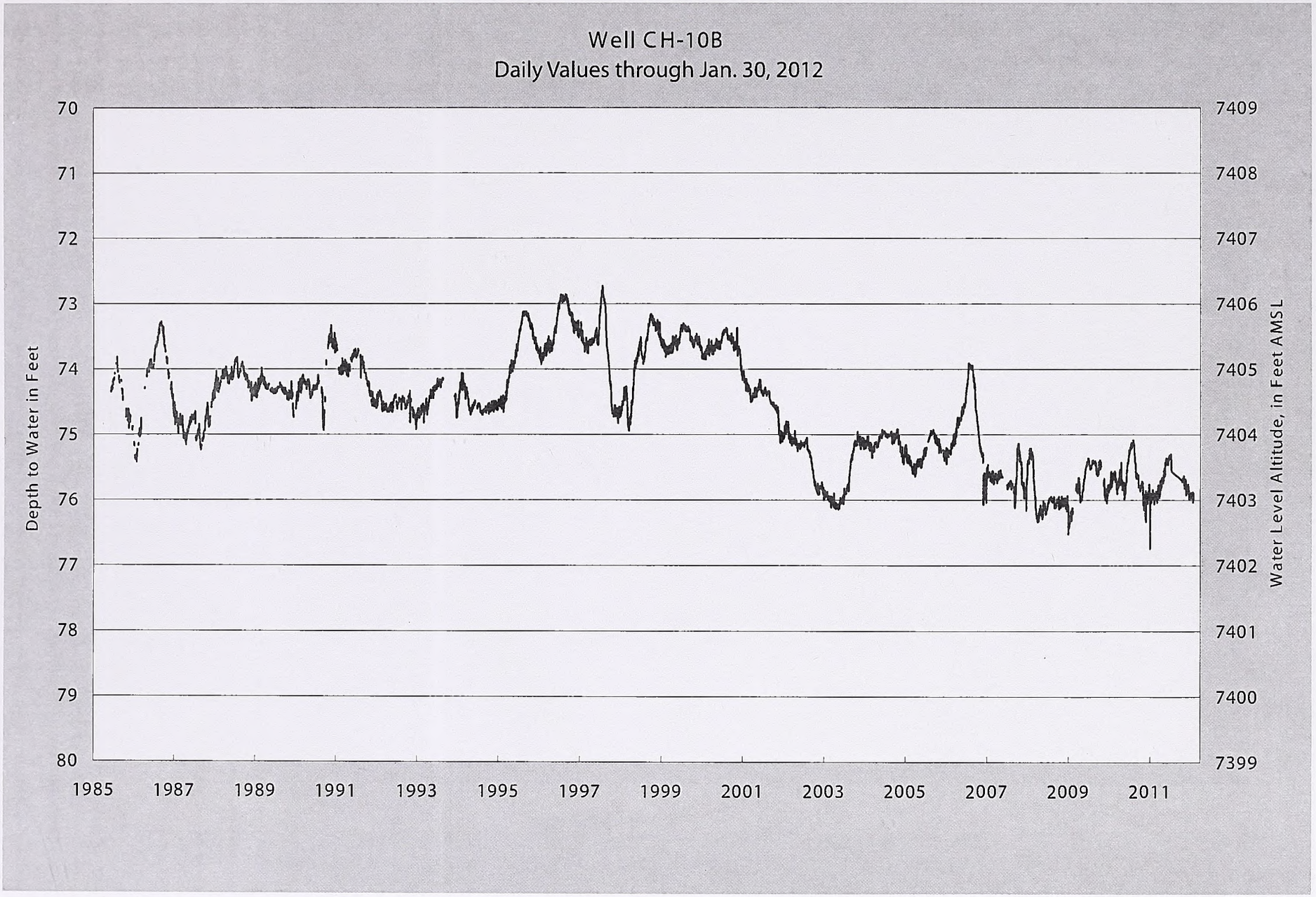
HOT CREEK DATA

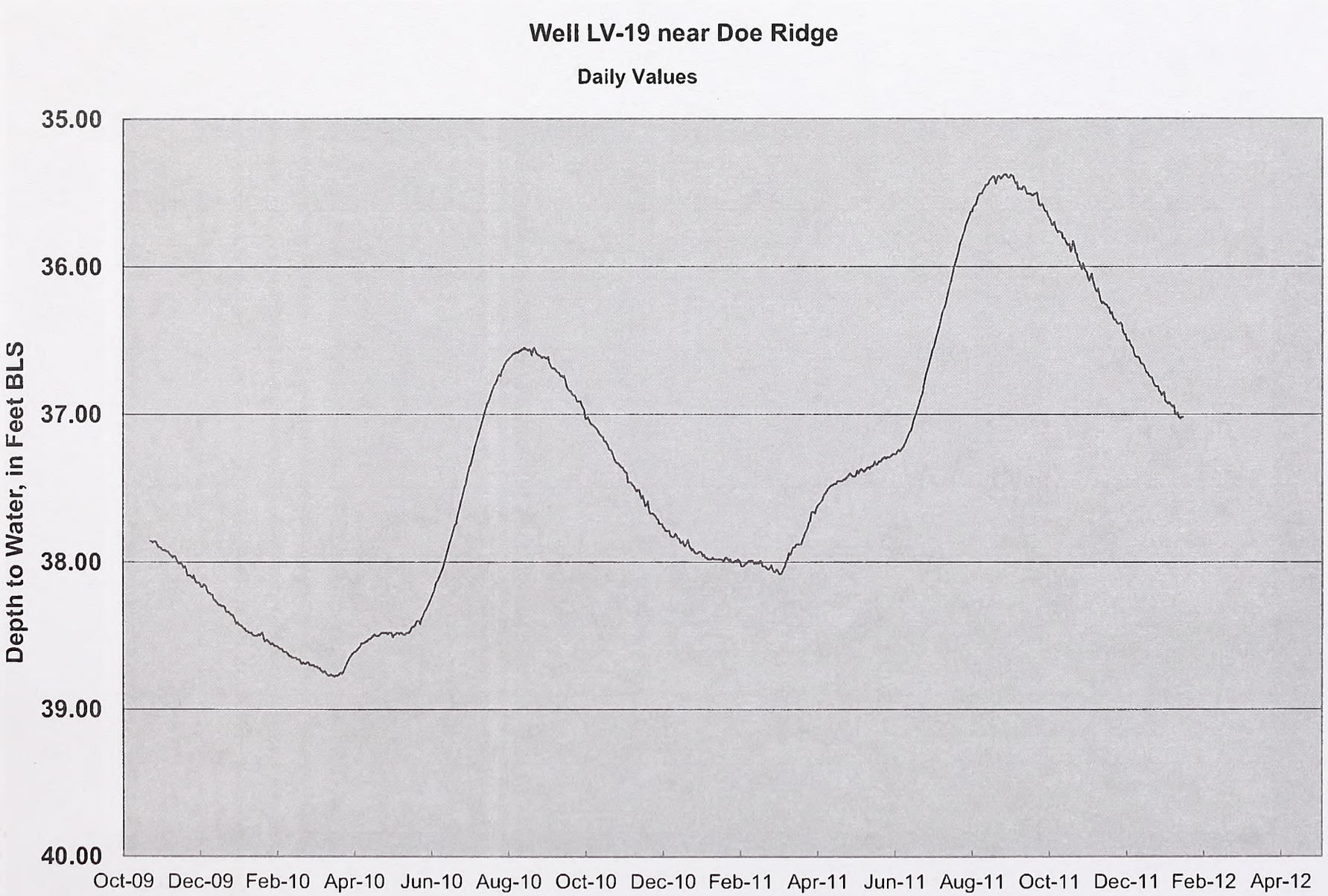
Hot Creek flume daily mean discharge 1983 through 2011
Graph of estimated thermal water discharge 1988 through 2011

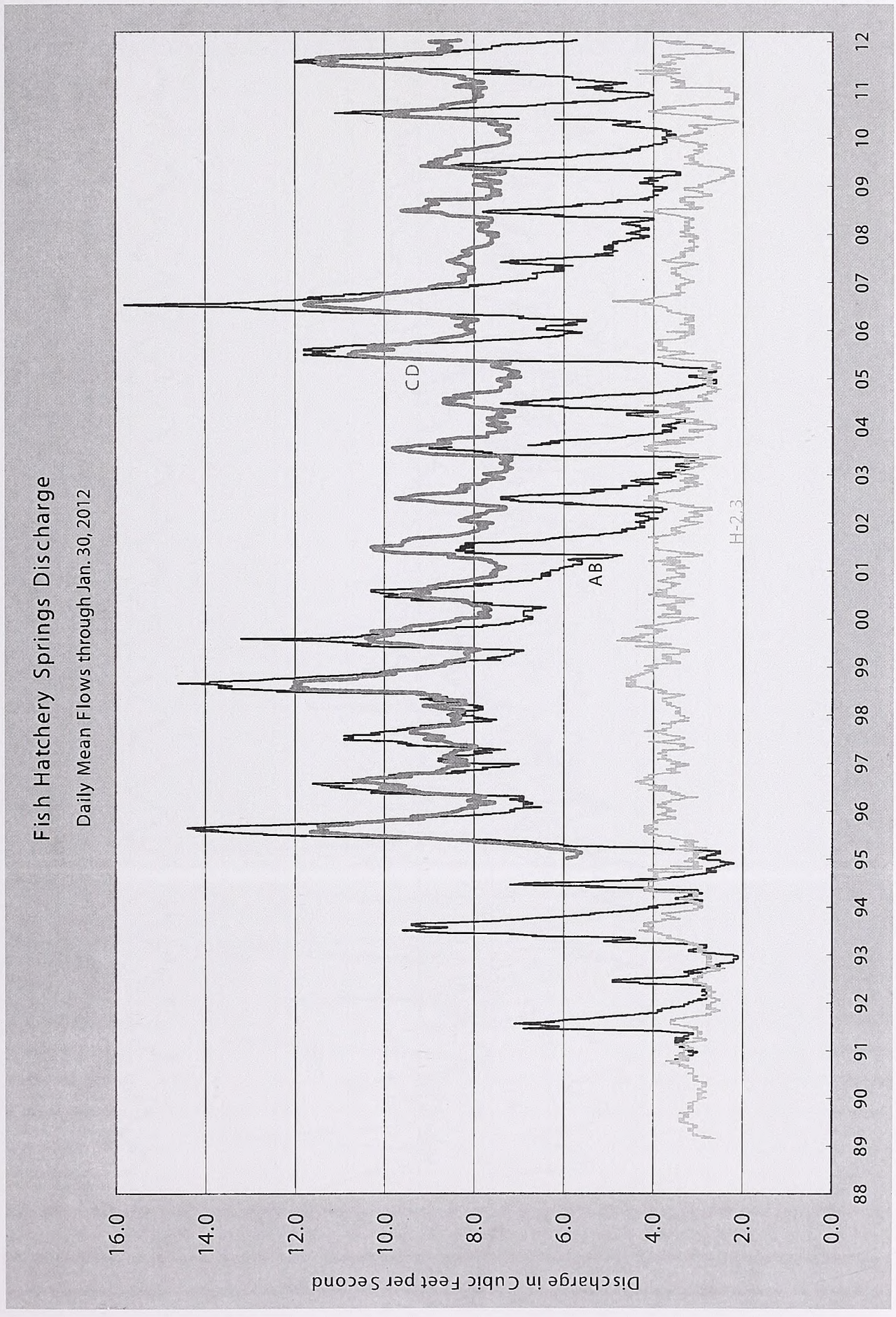
PRECIPITATION

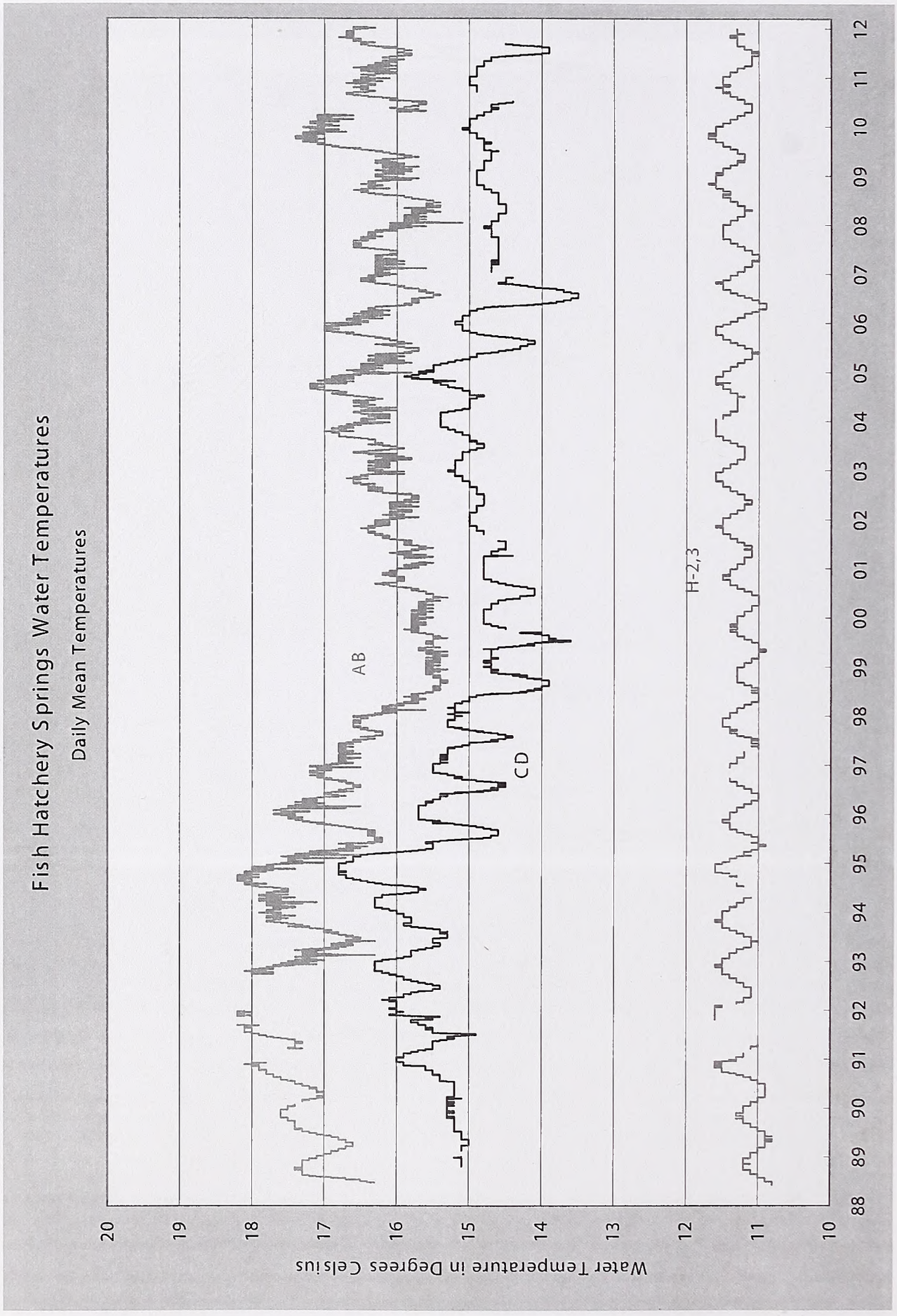
Precipitation measured at Mammoth Ranger Station 1982 through 2011
Precipitation by months

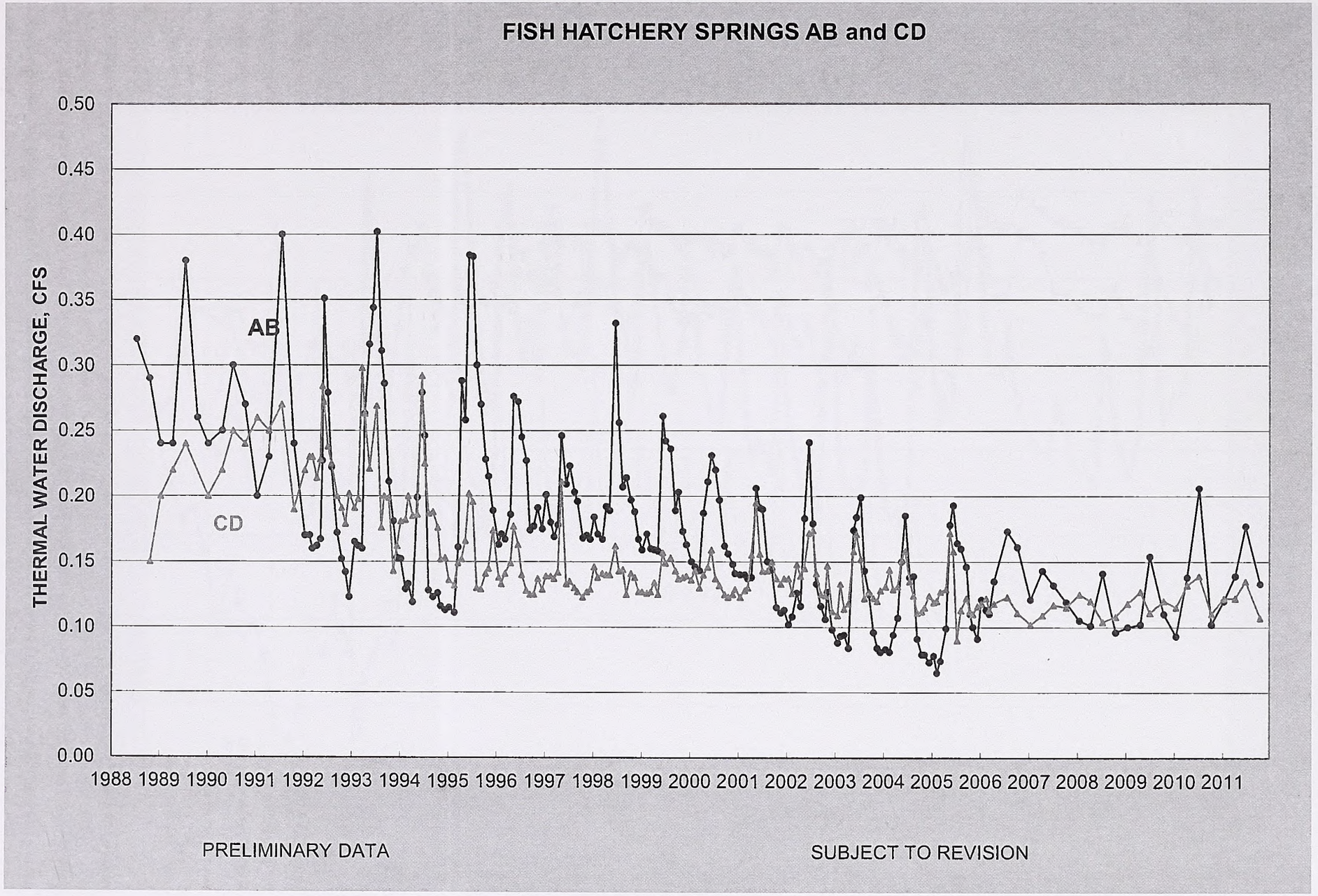
Cover Photo: Well 12-25 during drilling, August 25, 2011.


Well CH-10B
Daily Values through Jan. 30, 2012
Depth to Water in Feet
Water Level Altitude, in Feet AMSL
70
71
72
73
74
75
76
77
78
79
80
7409
7408
7407
7406
7405
7404
7403
7402
7401
7400
7399
1985
1987
1989
1991
1993
1995
1997
1999
2001
2003
2005
2007
2009
2011


Well LV-19 near Doe Ridge
Daily Values
Depth to Water, in Feet BLS
35.00
36.00
37.00
38.00
39.00
40.00
Oct-09
Dec-09
Feb-10
Apr-10
Jun-10
Aug-10
Oct-10
Dec-10
Feb-11
Apr-11
Jun-11
Aug-11
Oct-11
Dec-11
Feb-12
Apr-12

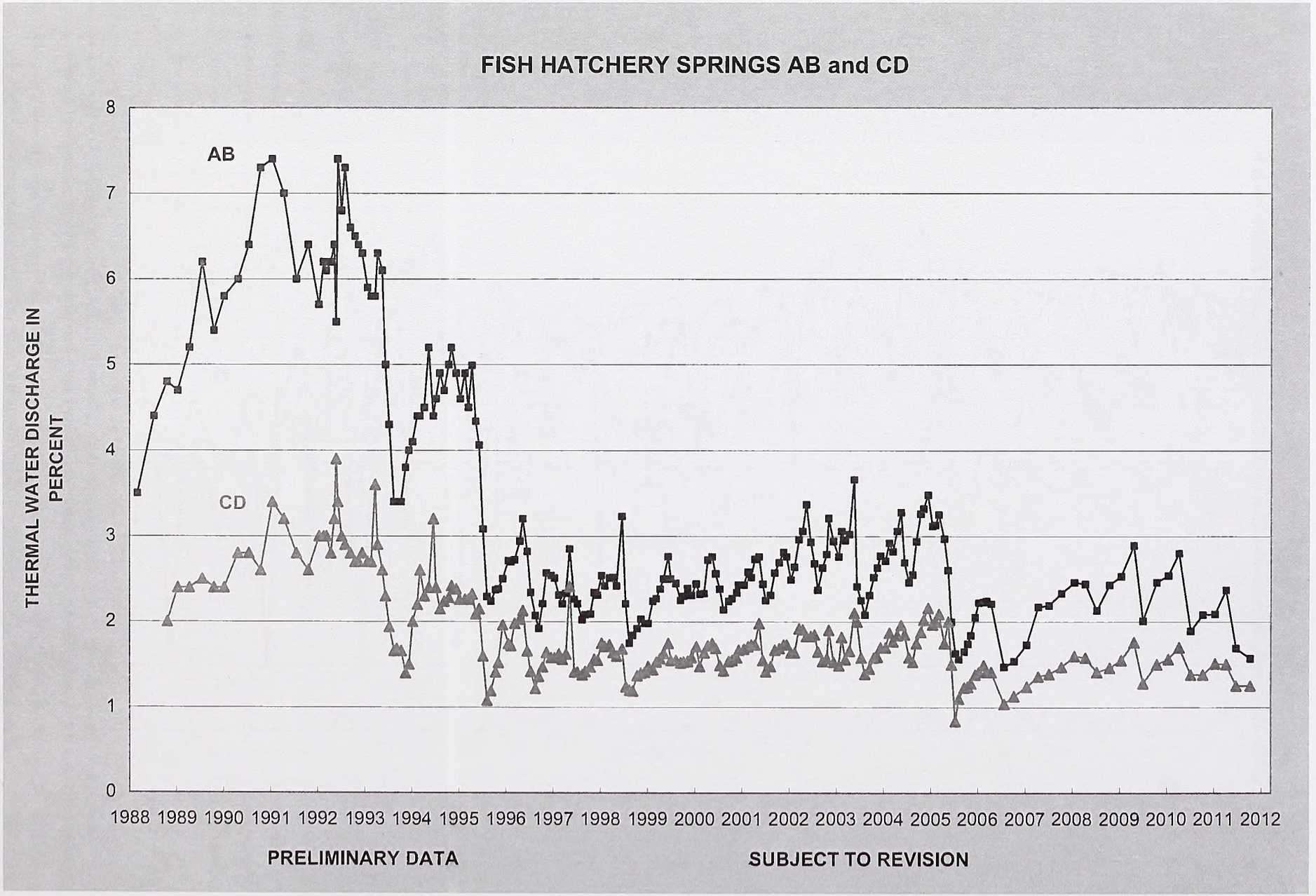

Fish Hatchery Springs Discharge
Daily Mean Flows through Jan. 30, 2012
Discharge in Cubic Feet per Second
16.0
14.0
12.0
10.0
8.0
6.0
4.0
2.0
0.0
88 89 90 91 92 93 94 95 96 97 98 99 00 01 02 03 04 05 06 07 08 09 10 11 12
CD
AB
H-2,3


Fish Hatchery Springs Water Temperatures
Daily Mean Temperatures
Water Temperature in Degrees Celsius
20
19
18
17
16
15
14
13
12
11
10
88 89 90 91 92 93 94 95 96 97 98 99 00 01 02 03 04 05 06 07 08 09 10 11 12
AB
CD
H-2,3



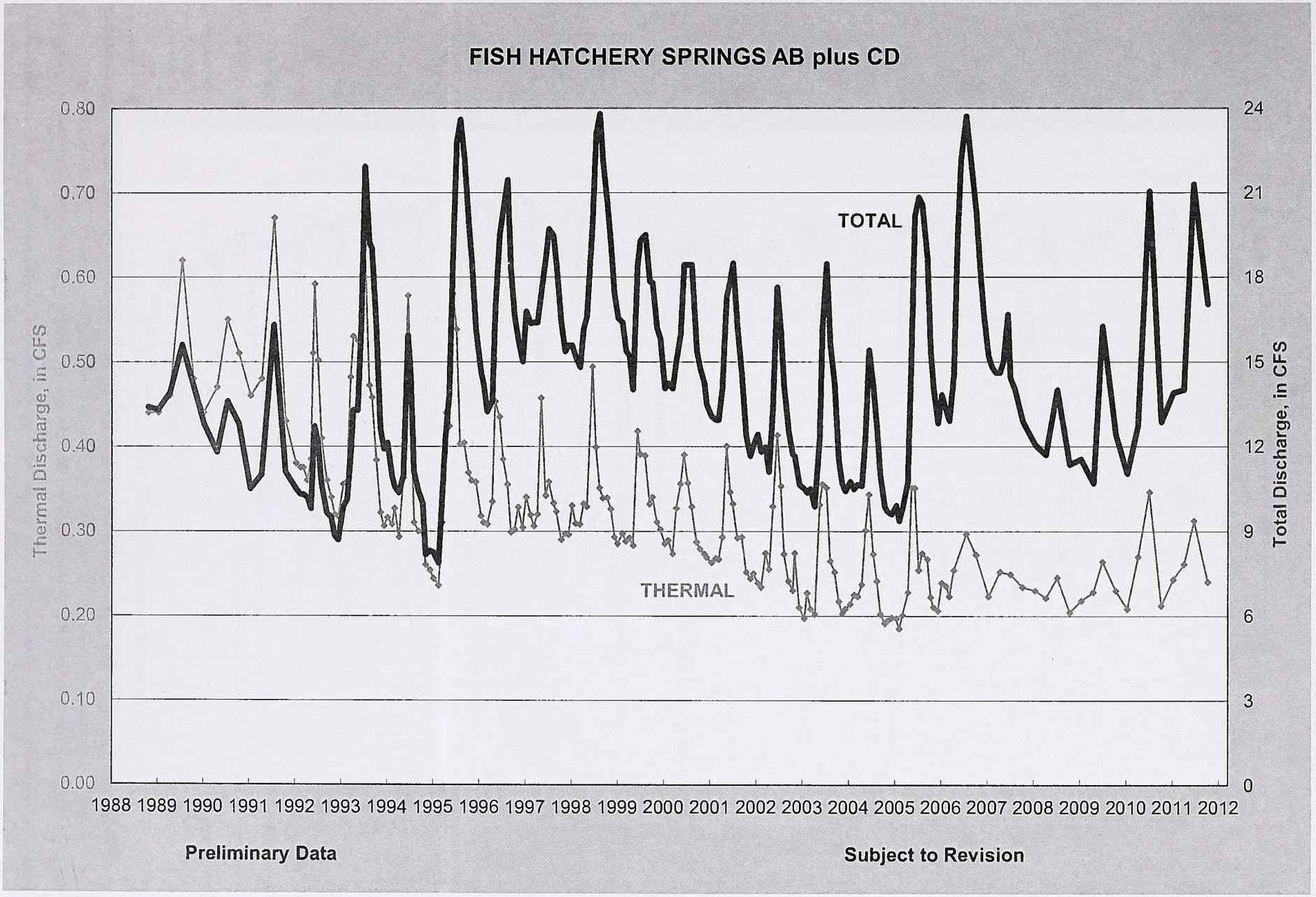
2/13/2012

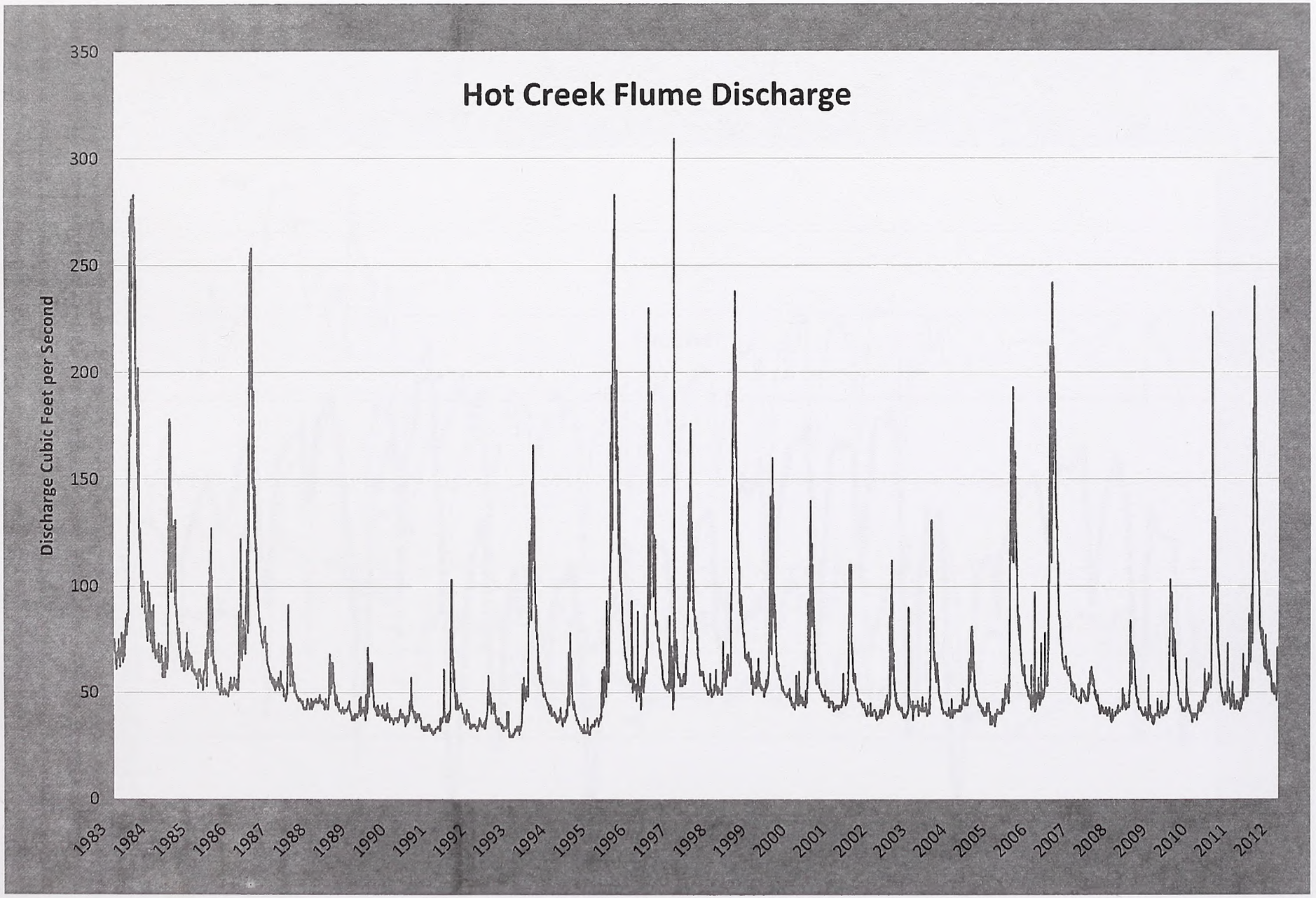
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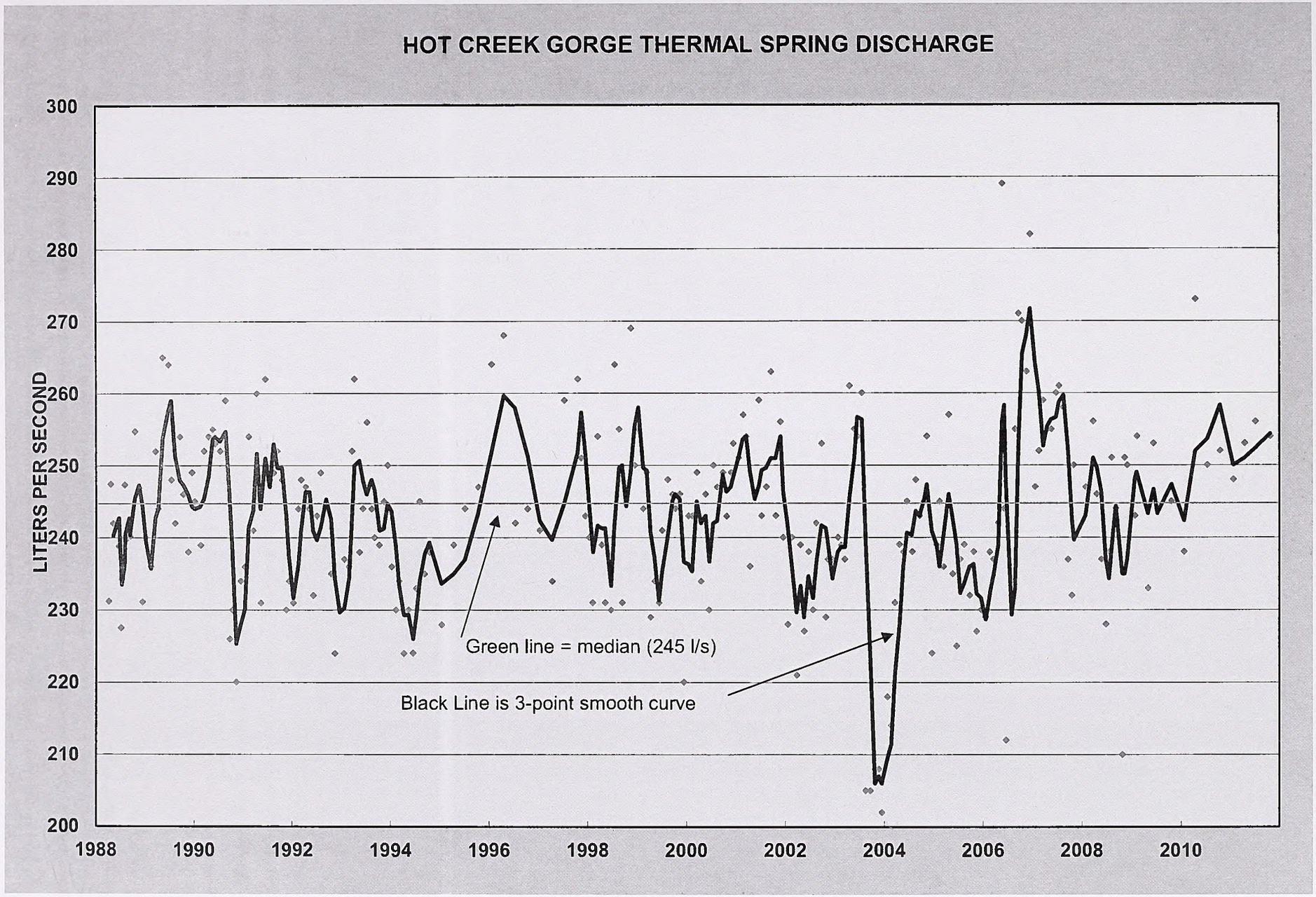


2/13/2012

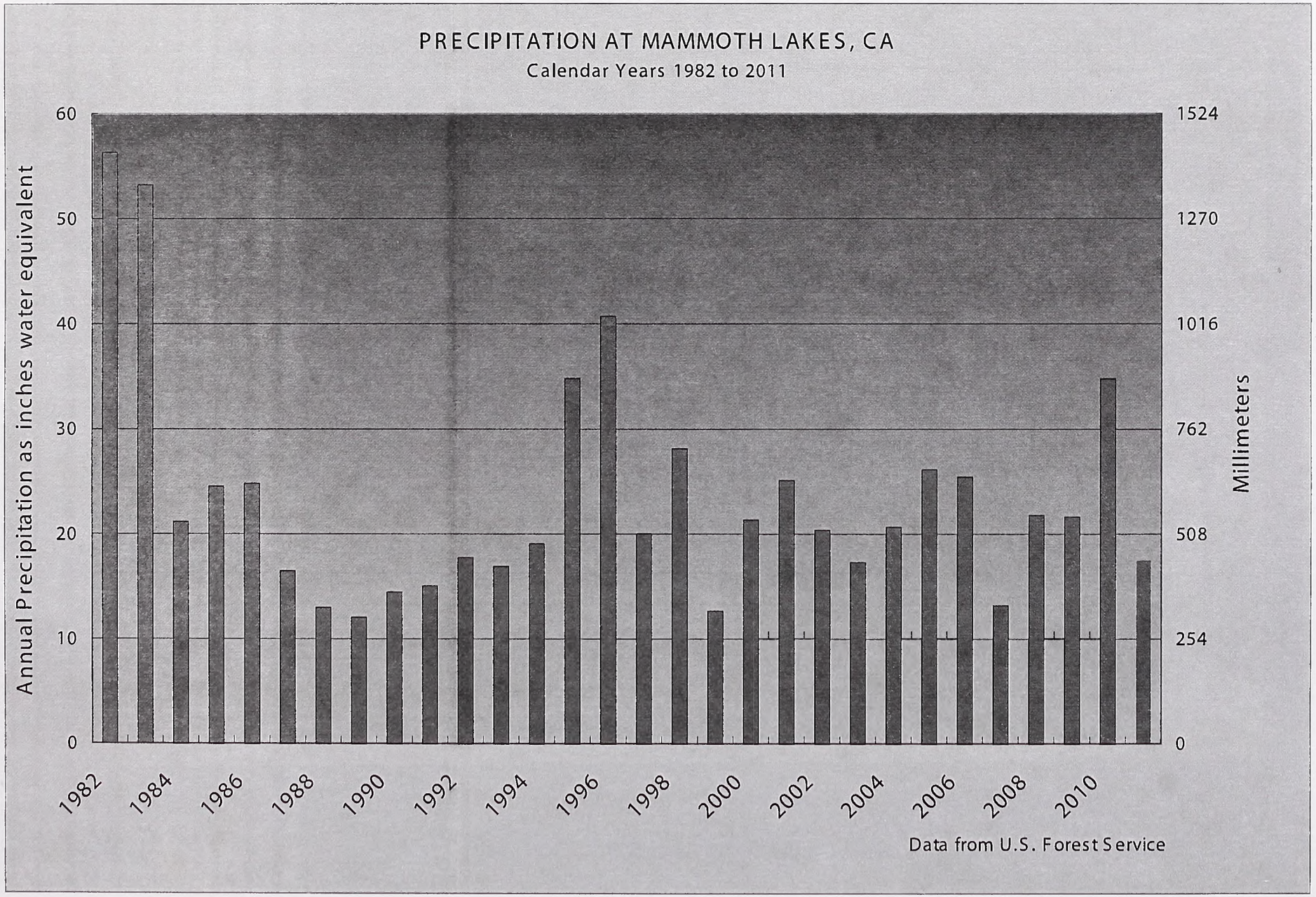
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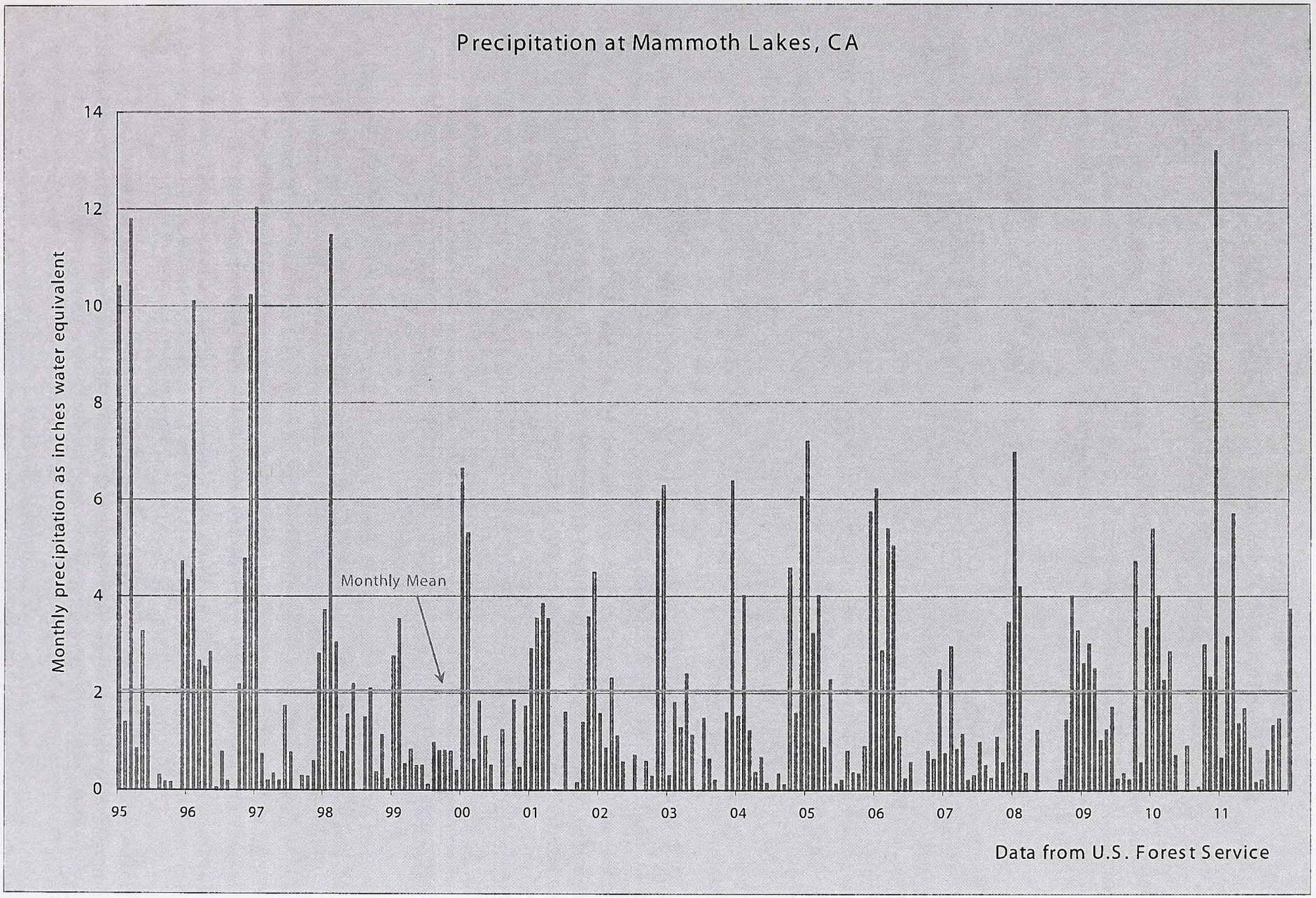

FISH HATCHERY SPRINGS AB plus CD
Thermal Discharge, in CFS
Total Discharge, in CFS
TOTAL
THERMAL
0.80
0.70
0.60
0.50
0.40
0.30
0.20
0.10
0.00
24
21
18
15
12
9
6
3
0
1988 1989 1990 1991 1992 1993 1994 1995 1996 1997 1998 1999 2000 2001 2002 2003 2004 2005 2006 2007 2008 2009 2010 2011 2012
Preliminary Data
Subject to Revision


Hot Creek Flume Discharge
Discharge Cubic Feet per Second
350
300
250
200
150
100
50
0
1983
1984
1985
1986
1987
1988
1989
1990
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
2007
2008
2009
2010
2011
2012



PRELIMINARY DATA SUBJECT TO REVISION


PRECIPITATION AT MAMMOTH LAKES, CA
Calendar Years 1982 to 2011
Annual Precipitation as inches water equivalent
Millimeters
60
50
40
30
20
10
0
1524
1270
1016
762
508
254
0
1982
1984
1986
1988
1990
1992
1994
1996
1998
2000
2002
2004
2006
2008
2010
Data from U.S. Forest Service


Precipitation at Mammoth Lakes, CA
Monthly precipitation as inches water equivalent
14
12
10
8
6
4
2
0
Monthly Mean
95
96
97
98
99
00
01
02
03
04
05
06
07
08
09
10
11
Data from U.S. Forest Service

TO: BLM Bishop Field Office
Attn: Casa Diablo IV Development Project Draft EIS/EIR
c/o Collin Reinhardt, Project Manager
351 Pacu Lane, Suite 100, Bishop, California 93514

FROM: Drew Foster, Conservation Associate
Friends of the Inyo
819 N Barlow Ln
Bishop, CA 93514

RE: Casa Diablo IV Geothermal Development Project Joint Draft EIS/EIR

Friends of the Inyo is a Bishop, CA-based non-profit conservation organization dedicated to the preservation, exploration and stewardship of the Eastern Sierra's public lands. Our membership includes local residents and visitors of the Eastern Sierra, who are deeply concerned with and connected to protecting many of the values that make the region unique, including wild and scenic character, historic significance, unconfined recreational opportunities, clean air and water. With this in mind, we are pleased with the opportunity to comment on the Casa Diablo IV Geothermal Development Project Joint Draft EIS & EIR, released in November 2012. This project has the potential to cause significant impacts to an important region in the Mammoth Lakes area, with regard to recreational uses, wildlife and plant habitats, water quality and availability, and other factors.

Friends of the Inyo (FOI) recognizes the efforts and goals of the Project Applicant (ORNI 50 LLC, wholly-owned subsidiary of Ormat Nevada Inc.) in its efforts to assist in the management objectives of: Secretarial Order 3285A1, dated March 11, 2009, and amended on February 22, 2010, which "establishes the development of renewable energy as a priority for the Department of the Interior"; as well as, California's goal to increase it's Renewables Portfolio Standard (RPS) to 33 percent of total procurement by 2020, established in 2002 under Senate Bill 1078, accelerated in 2006 under Senate Bill 107, and expanded in 2011 under Senate Bill 2X (CPUC, 2012). Achieving these ambitious renewable energy goals has often put public lands in an unfortunate position in the recent past, creating conflicts between environmental quality, recreational opportunities, and development of renewable energy technologies.

The Project Area, known to many as the Shady Rest area near Mammoth Lakes, CA is a well known, and highly utilized area for recreationists throughout the year. It is a region that offers quiet recreation, opportunities for solitude; it is largely undeveloped with the exception of campgrounds and the existing geothermal facilities. It provides a portion of unfragmented Jeffrey Pine forest and sagebrush scrub habitat, until it reaches highways 395 and 203. Many recreational and land use planning efforts have only just begun in the region, and it is disconcerting to think that this project may pre-empt these planning efforts, and pre-determine some of the best possible uses, relegating them to the constraints of the proposed developments and expansion of pipelines, well heads, and power plants outlined within this project. Friends of the Inyo would encourage methods and practices, during the construction, operation, and decommissioning phases, which incur the least impact to the environment and the recreational experience that occur in the project area. I13-1

Comments related to Chapter 4:

Air Resources

Friends of the Inyo supports the Mitigation Measures AQ-1 and AQ-2 under Section 4.2.9, promoting a strong commitment to continually exploring new technologies and alternatives to reduce Criteria Pollutants and emissions. **I13-2**

Biological Resources – Vegetation

- PDM BIO-4 and Mitigation Measure VEG-2: "trucks washed to remove soil and plant parts"; FOI supports sourcing recycled or gray water for this process **I13-3**
- Mitigation Measure VEG-2.3. *Monitoring*: FOI strongly supports this Mitigation Measure, particularly the personnel training clause, "personnel shall be trained to identify weedy and native species and work with a trained vegetation monitor to determine where elimination is necessary." **I13-4**
- PDM BIO-8: "Appropriate weed control measures" are not well identified. Will herbicides be used, and have they been cleared? Herbicides usually need hand application, as spraying is not generally permitted; FOI recommends a strong focus for invasive plant monitoring and control where well pads are both constructed, removed and decommissioned. **I13-5**
- Monitoring programs should be extended to include five years after project completion and decommissioning, versus the three years identified in the Project Design Measures **I13-6**

Biological Resources – Wildlife

- PDM BIO-1: This should include sections that allow for animal undercrossings (at least 24") and/or overcrossings (design to be determined) every 600 to 1,000 feet, regardless of where it will already go underneath roads. Also, wildlife specialists should walk the length of pipeline more than once per year, consult with USFS, BLM, CDFG and USFWS to determine a more appropriate monitoring interval. **I13-7** **I13-8**
- Wildlife crossings for the pipelines are related to the issue of recreational conflicts for crossing pipelines. Please develop and identify more creative ways for wildlife, hikers, cross country skiers, snowmobilers and others to cross, both over and under, at various intervals within the forest. **I13-9**
- During Construction phases of the project, there must be strict conformity to nesting bird seasons, the Migratory Bird Treaty Act, and the Bald and Golden Eagle Protection Act. Considering the scale of this project, no incidental take should be allowed or incurred whatsoever. **I13-10**
- Mule Deer migration routes should have an additional monitoring and mitigation component, perhaps coupled with more pipeline crossing opportunities throughout the forest. It would be advisable that the Project Applicant use the **I13-11**

Precautionary Principle and create more wildlife crossing opportunities during the construction phase, rather than having to mitigate for future impacts. I13-11 cont.

- FOI supports all the WIL-1 through WIL-7 Mitigation Measures for Wildlife. Although WIL-4 should include more than one deer crossing opportunity I13-12
- Monitoring programs should be extended to include five years after project completion and decommissioning I13-13

Greenhouse Gases

Section 4.5.2 and Section 4.5.9 should include a more robust discussion of Project Design Measures and Mitigation Measures, in order to address reduction of Greenhouse Gases. An example may be: "Utilize non-motorized equipment wherever feasible", or "Use hand tools and non-motorized equipment during the decommissioning phases of the project." More discussion around the construction and operations fleet and utilizing newest technologies to reduce Greenhouse Gas emissions could also be included here. I13-14

Cultural Resources

See comments below regarding, "Least Necessary Development to Achieve Goals" and developing a prioritized list of construction and development in order to potentially reduce conflicts. I13-15

Geothermal and Groundwater Resources

The proposed project would effectively triple the rate of groundwater pumping. Modeling forecasts can only predict so much, and there are many unknowns and variables that remain regarding the water table and aquifer in the Long Valley. It is noted and obvious that the project area is a geologically active one, and it could change dramatically at any given time, fundamentally changing any forecasting models, and baseline information regarding the geothermal resource, and underlying geomorphic makeup. I13-16

4.7.8.8 Mitigation Measures: It would be good to include mitigation measures in this section. A mitigation measure including the reduction of geothermal extraction would be appropriate if monitoring revealed an adverse impact to any of a variety of resources. I13-17

Project Design Measure GEO-5: Would like to see a monitoring plan developed within the first year of construction, that includes monitoring hydrothermal, water quality and quantity, and habitat impacts I13-18

Land Use

PDM LU-1: Consider the use of paint on the pipeline as a disguise. FOI also promotes vegetation as a visual cover rather than using fencing or other additional potential barriers to wildlife and recreationists. I13-19

The Mammoth Lakes Trails Master Plan is referenced but there should be more consultation regarding future planning efforts in the Shady Rest area. This is an area with a long history of recreational use, planning, discussion, and conflict, and it deserves further coordination of interested parties and constituents. A potential mitigation could be the funding of a Shady Rest collaborative planning effort, similar to that of the Sherwins Area Recreational Plan, or the Lakes Basin Special Study efforts. Again, we would reiterate that it is important that the best possible uses for this area are not relegated to the constraints of this geothermal development project. **I13-20**

Sawmill Cutoff Road Reconstruction Project and Inyo National Forest Shady Rest Motorized Staging Project, Trails System Master Plan, Parks and Recreation Master Plan Update, Digital 395 Middle Mile Project (identified in Table 4.1-1: CD-IV Cumulative Projects), recognized as overlapping with the project area, what are the planning and mitigation measures to address this overlap? **I13-21**

Noise and Vibration

Were nighttime noise levels measured for ambient operating noise of wells and the nearby campgrounds? It does not seem to be differentiated in Ch. 4.11, nor in Appendix E. Nighttime construction noise levels are considered, but nothing seems to have been studied in regards to the noise levels coming from the operating wells near the campgrounds. **I13-22**

4.11.2. Project Design Measures. Only mitigations for construction noise are identified, it would be good to include more mitigations for operating noise (see below). **I13-23**

4.11.9. Mitigation Measures: It is disappointing to see that no Mitigation Measures were provided here. A potential mitigation could be increased padding/noise reducing materials around pumping well heads, as well as the power plant facilities. **I13-24**

Recreation

As a co-signatory, Friends of the Inyo will defer comments related to Recreation to those provided by Mammoth Lakes Trails – Public Access. **I13-25**

General Comments

Comprehensive Monitoring and Adaptive Management

For all aspects of the proposed project and its environmental impacts, a holistic and comprehensive monitoring strategy should be implemented. Of particular importance and focus are impacts to vegetation and wildlife, groundwater and hydrothermal resources, recreational impacts, and air resources. **I13-26**

While a relatively comprehensive study on the impacts to hydrologic and geothermal resources was completed, there are still many unknowns and variables that exist and will remain about the underlying geologic makeup of the Long Valley. Continual and comprehensive monitoring must be incorporated in the surrounding watershed to determine if significant adverse impacts are occurring, during the lifetime of the project, to the water temperature, chemical makeup, water pressures at springs, habitat viability, effects on public water availability, and other measurable factors.

I13-26 cont.

Adaptive Management Strategies should be included to establish baseline data, identify clear monitoring objectives, impact thresholds, technological advances for monitoring, mitigation, and operations, and recognize needs for response and change in management.

I13-27

Least Necessary Development to Achieve Goals

While Friends of the Inyo does not advocate for one Project Alternative or another as proposed within the Joint Draft EIS/EIR, we do advocate for the least amount of development and expansion necessary to achieve the desired goals and objectives stated in Chapter 2.1.2.

It has been discussed in several public meetings that only the minimum number of the proposed wells would be drilled until the desired level of geothermal resource was obtained. However, this is not made clear in the Joint Draft EIS/EIR. It would be helpful to see a prioritized list from the Project Applicant, along with a timeline, of wells to be drilled, and pipeline to be constructed. With the understanding that the production of each individual well is unknown, there should still be a prioritized plan of which wells are to be drilled first, and subsequent well pads and pumping facilities constructed. Lower priorities could be given to the areas with the highest potential conflicts, be it recreational, cultural, biological, or otherwise. This list would have been helpful in the Draft phase, but would still be of use when the Joint Final EIS/EIR is released.

I13-28

Thank you for the opportunity to comment on this project.

Sincerely,

Drew Foster, Conservation Associate
Friends of the Inyo

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January 30, 2013

RECEIVED JAN 3 1 2013

Via Electronic Mail and Overnight Delivery

Attn: Mr. Collin Reinhardt, Project Manager
Casa Diablo IV Geothermal Development Project Draft EIS/EIR
BLM, Bishop Field Office
351 Pacu Lane, Suite 100
Bishop, CA 93514
Fax: (760) 872-5050
Email: cabipubcom@ca.blm.gov; creinhardt@blm.gov

Re: Comments on Casa Diablo IV Geothermal Development Project Draft EIS/EIR (CACA 11667).

Dear Mr. Reinhardt:

This letter is submitted on behalf of Laborers International Union of North America, Local Union 783, and its members living in Mono County (collectively "LiUNA" or "Commenters") regarding the Draft Environmental Impact Statement ("EIS") / Environmental Impact Report ("EIR") (collectively, "Draft EIS/EIR") for the Casa Diablo IV Geothermal Development Project (CACA 11667), DOI Control No. DES 12-21, Publication Index No. BLM/CA-ES-2013-002+1793, State Clearinghouse No. 2011041008, including the construction, operation, maintenance and decommissioning of a 33 megawatt (MW) geothermal power generating facility and related infrastructure near Mammoth Lakes in Mono County, California (collectively "Project," "Casa Diablo Project" or "CD-IV Project").

We have prepared these comments with the assistance of expert hydrogeologist Heidi M. Rhymes, PG. Ms Rhymes concludes that the Project is likely to have significant impacts on local, potable groundwater resources and surface water quality, as well as significant cumulative impacts on depletion of the area's geothermal resources, as well as induced seismicity. These impacts are not adequately identified and mitigated by the Draft EIS/EIR. Ms. Rhymes' comments and curriculum vitae are attached hereto as Exhibit A.

Commenters also submit expert comments of Dr. Shawn Smallwood, Ph.D., an expert wildlife biologist who has expertise in the areas of wildlife movement corridors, habitat fragmentation, and special-status species such as bald and golden eagles, bats, American badger and other species relevant to the Project and to this Draft EIS/EIR. Mr. Smallwood concludes that the Project is likely to have significant impacts on at least 17 special-status species, and that Draft EIS/EIR fails to adequately disclose or mitigate these impacts. Dr. Smallwood's comments and curriculum vitae are attached hereto as Exhibit B.

Finally, Commenters submit the expert comments of atmospheric scientist James Clark, Ph.D., who concludes that the Draft EIS/EIR failed to perform an adequate air quality analysis for the Project, failed to perform an odor analysis, and failed to adequately screen the Project's air quality impacts by failing to describe and analyze the Project's impacts in relation to all Project components and other existing and reasonably forseeable geothermal development projects in the Mammoth Lakes area. Dr. Clark's comments and curriculum vitae are attached hereto as Exhibit C.

The comments of Ms. Rhymes, Dr. Smallwood and Dr. Clark are incorporated herein by reference in their entirety. Each comment letter requires separate responses in the Final EIS/EIR. Commenters also attach and incorporate by reference herein comments submitted on the related Mammoth Pacific I Replacement Project ("MP-I Project"), including LiUNA comments dated October 10, 2012 (Exhibit D) and November 12, 2012 Exhibit E), along with attached expert comments of wildlife biologist Luke Macauley, and various other comments received on the MP-I Project (Exhibit F).[1]

[1] Additional attached comments include:

- March 15, 2012 letter of David Marcus, Consultant, regarding reported capacity, and output generation of existing geothermal plant;
- March 22, 2012 letter of Matt Hagemann, P.G., C.Hg., *Comments on the Proposed Mammoth Pacific I Replacement Project Revised Draft Environmental Impact Report*;
- March 22, 2012 letter of James Clark, Ph.D., Clark & Associates, *Comment Letter on Proposed Mammoth Pacific MP-I Plant Replacement Revised Draft Environmental Impact Report (RDEIR)*;
- March 23, 2012 letter of Scott Cashen, M.S., Senior Biologist, *Comments on Revised Draft Environmental Impact Report for Mammoth Pacific I Replacement Project;*
- March 30, 2012 letter of Jan. M. Zimmerman. P.G., Environmental Geologic, Lahontan Regional Water Quality Control Board, *Comments on*

After reviewing the Draft EIS/EIR together with our team of expert consultants, it is evident that the document contains numerous errors and omissions that preclude accurate analysis of the Project. As a result of these inadequacies, the Draft EIS/EIR fails as an informational document, fails to adequately identify preferred and environmentally superior Project alternatives, fails to properly analyze and mitigate the cumulative impacts of the Project in connection with numerous other existing and planned geothermal development projects in the Mono-Long Valley Known Geothermal Resource Area ("KRGA"), and fails to impose feasible mitigation measures to reduce the Project's significant individual impacts.[2]

I14-1

LiUNA Local 783 recognizes that the development of reliable renewable energy sources is critical for California's future, and supports California and the nation's mission to reduce dependency on fossil fuels. In particular, LiUNA supports the development of clean, renewable energy technology, including the use of geothermal power generation where feasible, and the sustainable use of public lands for multiple uses where appropriate. All geothermal extraction projects must be properly analyzed and carefully planned to minimize impacts on the environment. Geothermal extraction projects should avoid impacts to sensitive species and habitats, and should take all feasible steps to ensure that the production of renewable energy is not done at the expense of the State's and federal forests' natural resources, and dependent species. Only by maintaining the highest standards in these and other ways can energy supply development be truly sustainable. Unfortunately, the Project falls short in these and other ways. As a consequence, the Draft EIS/EIR will need to be revised and recirculated, as set forth below.

I14-2

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the Revised Draft Environmental Impact Report (EIR) for the Mammoth Pacific I Replacement Project, Mammoth Lakes, Mono County;

- October 17, 2012 letter of Dr. Petra Pless, D.Env., *Comments on Final Environmental Impact Report for Mammoth Pacific I Replacement Project*;
- October 18, 2012 letter of Matt Hagemann, P.G., C.Hg., *Comments on the Proposed Mammoth Pacific I Replacement Project Final Environmental Impact Report*;
- October 18, 2012 letter of Scott Cashen, M.S., *Comments on Final Environmental Impact Report for Mammoth Pacific I Replacement Project.*

[2] We reserve the right to supplement these comments at later hearings and proceedings for this Project. *See Galante Vineyards v. Monterey Water Dist.* (1997) 60 Cal. App. 4th 1109.

I. BACKGROUND

a. Casa Diablo IV Geothermal Development Project.

ORNI 50 LLC, a wholly-owned subsidiary of Ormat Nevada Inc., ("Applicant") has proposed to construct, operate, maintain and decommission a 33 net megawatt ("MW") geothermal power generating facility and related infrastructure in Mono County, California. The CD-IV Project would be located in the vicinity of the existing Mammoth Pacific L.P. ("MPLP") geothermal complex located within the Mono-Long Valley Known Geothermal Resource Area ("KGRA") near the town of Mammoth Lakes in Mono County, California. (DEIR, p. ES-1)

The majority of the CD-IV Project would be developed on National Forest System Lands where the surface resources are managed by the United States Forest Service (USFS), Inyo National Forest and the mineral resources are managed by the Bureau of Land Management (BLM), Bishop Field Office. Specifically, the Project would be located on Inyo National Forest lands and adjacent private lands within portions of Federal geothermal leases CACA–11667, CACA– 14407, CACA–14408, and CACA–11672. The leases proposed for development are part of an existing geothermal unit, which is currently providing energy sufficient to power three operating geothermal plants. The CD-IV Project would generate and deliver geothermal-generated power to the California electrical grid through an interconnection at the Southern California Edison ("SCE") Substation. (DEIR, p. ES-1)

The proposed action includes the following facilities:

1. A geothermal power plant consisting of two (2) Ormat Energy Converter (OEC) binary generating units (21.2 MW gross each) with vaporizers, turbines, generators, air-cooled condensers, preheaters, pumps and piping, and related ancillary equipment. The gross power generation of the CD-IV plant would be 42.4 MW. The estimated auxiliary and parasitic loads (power used within the project for circulation pumps, fans, well pumps, loss in transformers and cables) is about 9.4 MW, thus providing a net power output of about 33 MW. Additional components of the power plant would include:

    a) A motive fluid system consisting of motive fluid (n-pentane) storage vessels (either one or two vessels in the range of 9,000 to 12,000 gallons) and motive fluid vapor recovery systems (VRUs). Each VRU would consist of a diaphragm pump and a vacuum pump.

b) A new substation would be constructed on the power plant site and would be connected to the SCE Casa Diablo Substation at Substation Road.

c) An overhead 33 kV transmission line connecting the power plant substation with the SCE Casa Diablo Substation approximately 650 feet (198 meters) long.

2. Up to 16 geothermal wells are proposed. Fourteen of the wells would be located in the Basalt Canyon Area and two wells would be located southeast of the proposed power plant east of U.S. Highway 395. The specific locations for these wells would be selected out of the 18 possible locations (as shown in Figure 2-2 of the Draft EIS/EIR). The actual number may be less depending on the productivity of the wells. The final number and location of wells would be determined by modeling and actual drilling results. Approximately half of the wells would be production wells and the other half would be injection wells. Each production well would range in depth from 1,600 to 2,000 feet below ground surface (bgs), and each new injection well would be drilled to approximately 2,500 feet bgs. Production wells would be equipped with a down-hole pump powered by a surface electric motor. Most of the well sites in Basalt Canyon have been analyzed previously for the development of exploratory wells, two of which were drilled in 2011. Additional detail is provided in Section 2.2.4.

3. Piping would extend from production wells to the power plant and from the power plant to the individual injection wells. Two main pipelines would parallel the existing Basalt Canyon pipeline and would cross beneath U.S. Highway 395 between the wellfield and the CD-IV power plant site. Where pipelines must cross another pipeline or a road, the crossings would be underground.

4. Power and control cables for the wells would be installed in above-ground cable trays placed on the pipeline supports. Appurtenant facilities include pumps, tanks, valves, controls, and flow monitoring equipment. (DEIR, p. ES-3-4)

b. Geothermal Development in the Mono-Long Valley KGRA.

1. Historical Development of Geothermal Leases and Exploration.

The CD-IV Project would be conducted in large part on lands which were leased by the United States of America to MPLP under the Geothermal Steam Act of 1970, 30 USC § 1001-1025 ("Geothermal Steam Act" or "Act").

In 1973, the DOI produced a Final EIS which analyzed the potential impacts of geothermal leasing, including exploration and development drilling and power plant development, under the Geothermal Steam Act. This EIS specifically analyzed leasing, exploration, and development of areas within Mono-Long Valley KGRA (DOI, 1973). In 1979, the USFS completed the "Mammoth-Mono Planning Unit Land Management Plan" and associated EIS. The USFS decision provided for leasing, exploration, and possible development and utilization of geothermal resources within the Mono-Long Valley KGRA, including the Project area.

In 1980 and 1981, the USFS completed an Environmental Assessment ("EA") and issued a Decision Notice which approved geothermal leasing within portions of the KGRA. Leases for "Lease Block 1," which includes the Project area Geothermal Leases CACA-11667 and CACA-11672, were issued in early 1982. In 1982, the USFS completed a new EA for the area generally north and west of Lease Block 1, which became known as "Lease Block 2."

Within the Project area, Geothermal Leases CACA-14407 and CACA-14408 were issued as part of Lease Block 2 in early 1985. These leases contain a special stipulation which states that "Except as otherwise approved by the BLM and the Forest Service, no surface disturbing activities related to geothermal energy development will be permitted on the land designated as No Surface Occupancy areas. In order for exploration or development activities to be approved on these lands, the lessee must show that the proposed activity or development can take place without significantly affecting USFS management objectives for the land in question. Such objectives include visual quality objectives, recreation objectives, and wildlife habitat and population objectives" (BLM, 1984). The CD-IV Project components affected by these stipulations include pipelines and wells in the vicinity of wells 12A-31, 23-31, 35-31, 81-36, 14-25 and 15-25 ("Restricted Surface Occupancy Area").

2. Other Geothermal Facilities in the KGRA.

The Mammoth Lakes geothermal basin has been developed for geothermal power generation since approximately 1984. There are currently three geothermal power plants located within the MPLP Geothermal Complex (See DEIR, Figure 1-1, Existing Facilities). The CD-IV Project would be the fourth geothermal power plant in the complex. (DEIR, p. 1-4)

The three existing geothermal plants include:

- **MP I Project** (also called G-1): is a 10 MW geothermal electric generating facility and production and injection well field located on a 90-acre parcel

of private (fee) land leased to MPLP approximately 1,200 feet northeast of the intersection of U.S. Highway 395 and California State Route 203 in the Casa Diablo area of Mono County, California. MP I commenced operation in 1984. The EIR for the MP-I Replacement Project, which includes construction of a new power plant at the site, was recently approved by the County of Mono, and is currently in litigation. (See Exhibits D-F)

- **MP II Project**: The MP II project is an existing 15 MW geothermal electric generating facility and production and injection well field located on the same 90-acre parcel of private land leased to MPLP. The MP II power plant is located approximately 1,200 feet east-northeast of the MP I power plant.

- **PLES I Project**: A 15 MW constructed the third geothermal power plant located immediately south of the MP II project power plant. The PLES I power plant is a "twin" to the MP II project power plant and also commenced operation in 1990. It is located on National Forest System lands located within and managed by Inyo National Forest.

c. Procedural Background and Required Permits.

To initiate the environmental review process under the National Environmental Policy Act. 42 USC § 4321 et seq. ("NEPA"), the Applicant submitted an application to the BLM to construct, operate, and following the expected 30-year useful life, decommission the CD-IV Project.[3] The CD-IV Project would be located in the vicinity of the MPLP geothermal complex located within the KGRA near the town of Mammoth Lakes in Mono County, California.

In addition to the BLM permit, the CD-IV Project requires discretionary permits from the United States Forest Service ("USFS"), Inyo National Forest, and the Great Basin Unified Air Pollution Control District ("GBUAPCD").

BLM is the lead agency under NEPA. BLM is also the managing agency for subsurface mineral estate including geothermal resources. The Project requires approval by BLM of an Application for Geothermal Drilling, Commercial use, Site License and Construction Permit. (DEIR, pp. ES-1, 1-2) The BLM may

[3]The Applicant's initial application was filed on February 17, 2010 by Mammoth Pacific, L.P. (MPLP). Since then, MPLP was acquired by Ormat Nevada Inc., which formed a wholly owned subsidiary (ORNI 50, LLC) for the CD-IV Project. ORNI 50, LLC submitted a revised application to BLM in June 2012. (DEIR, p. ES-1)

issue a Record of Decision ("ROD") to approve, approve with conditions, or deny the application filed by the Applicant.

USFS is a cooperating agency for the Project under NEPA, and manages the surface lands in the proposed project area. The CD-IV Project requires the use of National Forest System Roads (NFSR) under the jurisdiction of USFS, unauthorized roads that have been created by users, and new roads for access to the individual wells. The USFS has the discretion to issue authorization for the commercial use of these roads. Accordingly, the Project will require a Special Use Authorization permit from USFS Inyo for use of existing roads, construction of new access roads, maintenance of all access roads (including winter plowing), and construction of a transmission line. The USFS will issue its own ROD, separate from the BLM ROD.

GBUAPCD is the lead agency for review under the California Environmental Quality Act, Pub. Res. Code § 21000 et seq. ("CEQA"), and is responsible for reviewing applications and issuing air permits within the air basin. An air permit from the GBUAPCD is required for construction and operation of the CD-IV Project. (DEIR, pp. ES-1, 1-2)

II. STANDING

Members of LIUNA Local 783 live, work, and recreate in the immediate vicinity of the proposed Project site. These members will suffer the impacts of a poorly executed or inadequately mitigated Project, just as would the members of any nearby homeowners association, community group, or environmental group. Members of LIUNA Local 783 live and work in areas that will be affected by geothermal and mineral exploration and water source reduction, air pollution, and impacts on plant and wildlife species generated by the Project. In addition, construction workers in particular will suffer many of the most significant impacts from the Project as currently proposed, such as close proximity exposure to construction-related air pollution. Therefore, LIUNA Local 783 and its members have a direct interest in ensuring that the Project is adequately analyzed and that its environmental and public health impacts are mitigated to the fullest extent feasible.

I14-3

III. LEGAL STANDARDS

A. NEPA

Congress enacted NEPA in recognition of the "profound impact of man's activity on the interrelations of all components of the natural environment," including "industrial expansion, resource exploitation, and new and expanding

technological advances." 42 U.S.C. § 4331(a). NEPA is the "basic national charter for protection of the environment." 40 C.F.R. § 1500.1(a).

NEPA requires that federal agencies prepare a "detailed statement"—known as an EIS—for all "major Federal actions significantly affecting the quality of the human environment." 42 U.S.C. § 4332. The environmental impact statement, or "EIS," is intended to create an open, informed, and public decision-making process that insures "that environmental information is available to public officials and citizens before decisions are made and before actions are taken" and "to help public officials make decisions that are based on understanding of environmental consequences, and take actions that protect, restore, and enhance the environment." 40 C.F.R. § 1500.1. A federal agency's obligation to prepare an EIS extends to any federal action that "will or may" have a significant effect on the environment. 40 C.F.R. § 1508.3. The federal agency must "[r]igorously explore and objectively evaluate" a range of alternatives to proposed federal actions and their impacts in the EIS. 40 C.F.R. § 1502.14(a).

The evaluation of mitigation measures is an essential component of an EIS. A federal agency is required to evaluate possible mitigation measures in defining the scope of the EIS, in examining impacts of the proposed action and alternatives, and in explaining its ultimate decision. *See* 40 C.F.R. §§ 1502.14(f), 1502.16(h), 1505.2(c), 1508.25(b).

Agencies must insure the professional integrity, including scientific integrity, of the discussion and analysis in an EIS. 40 C.F.R. § 1502.24. The information in an EIS must be of high quality, as accurate scientific analysis, expert agency comments, and public scrutiny are essential to implementing NEPA. 40 C.F.R. §§ 1500.1(b), 1502.24.

B. The Geothermal Steam Act of 1970.

The federal Geothermal Steam Act, 30 U. S. C. § 1001 et seq., was passed in 1970 to encourage the development of geothermal energy. The Act, and the Geothermal Resource regulations (43 CFR 3200), allow the leasing of land containing geothermal resources, with some exceptions. Congress excluded any lands within the National Park System, U.S. Fish and Wildlife Service lands, and any other lands prohibited from leasing by the Mineral Leasing Act of 1920. BLM administers the Act, issuing distinct authorizations for the exploration, development, production, and closeout of a geothermal resource.

Geothermal Lessees initially have ten years to reach a specified level of development with the land. Upon demonstrating such development, BLM extends their lease to 40 years, after which time lessees have the right to renew their lease. Geothermal leases convey the "exclusive right and privilege to drill

for, extract, produce, remove, utilize, sell, and dispose of geothermal steam and associated geothermal resources" on these leased lands. To maintain this right, the lessee must "diligently explore the leased lands for geothermal resources until there is production in commercial quantities" applicable to each of these leases. The lessee must also pay annual rentals to the federal government, and must expend increasing dollars until the production of geothermal resources in commercial quantities is achieved.

The Act gives the Secretary of the Interior the responsibility and authority to manage geothermal operations on lands leased for geothermal resource development by the United States of America. The Secretary has delegated this authority to the BLM. All operations conducted on the geothermal lease by the geothermal lessee are subject to the approval of the BLM. Under the regulations adopted to implement the Act (43 CFR 3200 et seq.), the BLM must review a Plan of Operation for drilling or a Utilization Plan for resource utilization operations ("Plan") submitted by a geothermal lessee.

Consistent with the requirements of the Federal Land Policy and Management Act ("FLPMA"), 43 U.S.C. §§1761 -1771, the Geothermal Steam Act prohibits leases for the development of geothermal energy where said development causes unnecessary degradation of public lands or resources. In such instances, BLM does not have the right to lease that land. The Act also made the BLM responsible for maintaining geothermal features within the National Park System.

C. The Federal Land Policy and Management Act ("FLPMA")

FLPMA sets forth the general management framework for the public lands based on the principles of multiple use and sustained yield. See 43 U.S.C. § 1732(a). Under FLPMA, it is the Department of the Interior ("DOI") to encourage the development of mineral resources, including geothermal resources, in federal lands. 43 U.S.C. §§ 1701(a)(7), (8), and (12). Such development must be strictly managed so as not to degrade or diminish the value of public lands. In particular, FLPMA requires that BLM "develop, maintain, and, when appropriate, revise land use plans" for the public lands, 43 U.S.C. § 1712(a), and that the agency "[i]n managing the public lands . . . take any action necessary to prevent unnecessary or undue degradation of the lands." 43 U.S.C. § 1732(b).

D. The Administrative Procedure Act ("APA")

The APA provides that a "person suffering legal wrong because of agency action, or adversely affected or aggrieved by agency action within the meaning of a relevant statute, is entitled to judicial review thereof." 5 U.S.C. § 702. The APA provides that a court shall set aside agency "findings, conclusions, and actions"

that are "arbitrary, capricious, an abuse of discretion, or otherwise not in accordance with law." 5 U.S.C. § 706(2)(A).

E. CEQA

CEQA requires that an agency analyze the potential environmental impacts of its proposed actions in an environmental impact report ("EIR") (except in certain limited circumstances). (*See, e.g.*, Pub. Res. Code § 21100.) The EIR is the very heart of CEQA. (*Dunn-Edwards v. BAAQMD* (1992) 9 Cal.App.4th 644, 652.) "The 'foremost principle' in interpreting CEQA is that the Legislature intended the act to be read so as to afford the fullest possible protection to the environment within the reasonable scope of the statutory language." (*Communities for a Better Environment v. Calif. Resources Agency* (2002) 103 Cal. App. 4th 98, 109.)

CEQA has two primary purposes. First, CEQA is designed to inform decision makers and the public about the potential, significant environmental effects of a project. (14 Cal. Code Regs. ("CEQA Guidelines") § 15002(a)(1).) "Its purpose is to inform the public and its responsible officials of the environmental consequences of their decisions before they are made. Thus, the EIR 'protects not only the environment but also informed self-government.'" (*Citizens of Goleta Valley v. Board of Supervisors* (1990) 52 Cal. 3d 553, 564) The EIR has been described as "an environmental 'alarm bell' whose purpose it is to alert the public and its responsible officials to environmental changes before they have reached ecological points of no return." (*Berkeley Keep Jets Over the Bay v. Bd. of Port Comm'rs.* (2001) 91 Cal. App. 4th 1344, 1354 ("Berkeley Jets"); *County of Inyo v. Yorty* (1973) 32 Cal.App.3d 795, 810)

Second, CEQA requires public agencies to avoid or reduce environmental damage when "feasible" by requiring "environmentally superior" alternatives and all feasible mitigation measures. (CEQA Guidelines § 15002(a)(2) and (3); See also, *Berkeley Jets*, 91 Cal. App. 4th 1344, 1354; *Citizens of Goleta Valley v. Board of Supervisors* (1990) 52 Cal.3d 553, 564) The EIR serves to provide agencies and the public with information about the environmental impacts of a proposed project and to "identify ways that environmental damage can be avoided or significantly reduced." (Guidelines §15002(a)(2)) If the project will have a significant effect on the environment, the agency may approve the project only if it finds that it has "eliminated or substantially lessened all significant effects on the environment where feasible" and that any unavoidable significant effects on the environment are "acceptable due to overriding concerns." (Pub.Res.Code § 21081; 14 Cal.Code Regs. § 15092(b)(2)(A) & (B))

While the courts review an EIR using an "abuse of discretion" standard, "the reviewing court is not to 'uncritically rely on every study or analysis

presented by a project proponent in support of its position. A 'clearly inadequate or unsupported study is entitled to no judicial deference.'" (*Berkeley Jets*, 91 Cal. App. 4th 1344, 1355 (emphasis added), quoting, *Laurel Heights Improvement Assn. v. Regents of University of California*, 47 Cal. 3d 376, 391 409, fn. 12 (1988)) As the court stated in *Berkeley Jets*, 91 Cal. App. 4th at 1355:

> A prejudicial abuse of discretion occurs "if the failure to include relevant information precludes informed decisionmaking and informed public participation, thereby thwarting the statutory goals of the EIR process." (*San Joaquin Raptor/Wildlife Rescue Center v. County of Stanislaus* (1994) 27 Cal. App. 4th 713, 722]; *Galante Vineyards v. Monterey Peninsula Water Management Dist.* (1997) 60 Cal. App. 4th 1109, 1117; *County of Amador v. El Dorado County Water Agency* (1999) 76 Cal. App. 4th 931, 946)

1. Joint NEPA / CEQA Documents.

CEQA contemplates there will be projects in which both CEQA and NEPA apply and it specifically provides for such occasions by setting forth various means of cooperation while at the same time ensuring that CEQA's standards are satisfied. (See, e.g., §§ 21083.5–21083.7; CEQA Guidelines, §§ 15220–15229, 15063, subd. (a)(2), 15361; *Nelson v. County of Kern* (2010) 190 Cal. App. 4th 252, 278.

A lead agency under CEQA may work with a federal agency to prepare a joint document which will meet the requirements of both CEQA and NEPA. 14 CCR § 15170. Where a project is subject to both NEPA and CEQA, cooperation between NEPA and CEQA lead agencies is required in the following areas: (a) Joint planning processes, (b) Joint environmental research and studies, (c) Joint public hearings, and (d) Joint environmental documents. 14 § CCR 15226. an analysis of the entire project is required.

IV. DISCUSSION

A. THE DRAFT EIS/EIR VIOLATES NEPA AND CEQA BECAUSE IT FAILS TO ANALYZE AND MITIGATE ALL POTENTIALLY SIGNIFICANT IMPACTS.

NEPA and CEQA contain "basically similar" requirements. *City of Carmel-by-the-Sea v. U.S. Dep't of Transp.* (9th Cir. 1997) 123 F.3d 1142. The Casa Diablo Project will have numerous significant impacts, as defined by both NEPA and CEQA, which impacts have been inadequately analyzed or mitigated in the Draft EIS/EIR under either law. For these reasons, and because the Draft EIS/EIR analyzes the Project's environmental impacts in a single document, Commenters present a single discussion of significant impacts of the Project herein. All issues identified in this section are raised equally under NEPA and CEQA, as well as under any other applicable laws as specified. I14-4

1. Legal Standards for Mitigation of Significant Impacts.

a. NEPA.

The evaluation of mitigation measures is an essential component of an EIS. A federal agency is required to evaluate possible mitigation measures in defining the scope of the EIS, in examining impacts of the proposed action and alternatives, and in explaining its ultimate decision. *See* 40 C.F.R. §§ 1502.14(f), 1502.16(h), 1505.2(c), 1508.25(b). The EIS must take a "hard look" at the environmental impacts of proposed major federal actions and provide a "full and fair discussion" of those impacts. 40 C.F.R. § 1502.1; *see also National Parks & Conservation Ass'n v. Babbitt*, 241 F.3d 722, 733 (9th Cir. 2001).

Under NEPA, the effect of a proposed action must be considered in the context of society as a whole, the region to be affected, any interests to be affected, and the immediate locale to be affected. 40 CFR § 1508.27(a). NEPA focuses on the "human environment," which includes both the natural and physical environment and the relationship of people to that environment. Although NEPA does not require that economic and social effects alone trigger the need for an EIS, these effects must be addressed if they are interrelated with natural or physical effects. 40 CFR § 1508.14. I14-5

Specifically, when evaluating the significance of environmental effects, an agency must consider the following:

> (1) Impacts that may be both beneficial and adverse. A significant effect may exist even if the Federal agency believes that on balance the effect will be beneficial.

(2) The degree to which the proposed action affects public health or safety.
(3) Unique characteristics of the geographic area such as proximity to historic or cultural resources, park lands, prime farmlands, wetlands, wild and scenic rivers, or ecologically critical areas.
(4) The degree to which the effects on the quality of the human environment are likely to be highly controversial.
(5) The degree to which the possible effects on the human environment are highly uncertain or involve unique or unknown risks.
(6) The degree to which the action may establish a precedent for future actions with significant effects or represents a decision in principle about a future consideration.
(7) Whether the action is related to other actions with individually insignificant but cumulatively significant impacts. Significance exists if it is reasonable to anticipate a cumulatively significant impact on the environment. Significance cannot be avoided by terming an action temporary or by breaking it down into small component parts.
(8) The degree to which the action may adversely affect districts, sites, highways, structures, or objects listed in or eligible for listing in the National Register of Historic Places or may cause loss or destruction of significant scientific, cultural, or historical resources.
(9) The degree to which the action may adversely affect an endangered or threatened species or its habitat that has been determined to be critical under the Endangered Species Act of 1973.
(10) Whether the action threatens a violation of Federal, State, or local law or requirements imposed for the protection of the environment. 40 CFR § 1508.27

I14-5 cont.

Failure by a federal lead agency to conduct a proper analysis of the cumulative impacts of a project in connection with other reasonably forseeable projects in the area is "arbitrary, capricious, an abuse of discretion, or otherwise not in accordance with law." (5 U.S.C. § 706(2)(A); *see Te-Moak Tribe of Western Shoshone of Nev. v. United States DOI*, 608 F.3d 592, 607 (9th Cir. Nev. 2010))

b. CEQA.

CEQA requires that an agency analyze the potential environmental impacts of its proposed actions in an environmental impact report ("EIR") (except in certain limited circumstances). (*See, e.g.*, Pub. Res. Code § 21100.) The EIR is the very heart of CEQA. (*Dunn-Edwards v. BAAQMD* (1992) 9 Cal.App.4th 644, 652.) "The 'foremost principle' in interpreting CEQA is that the Legislature intended the act to be read so as to afford the fullest possible protection to the environment within the reasonable scope of the statutory language."

(*Communities for a Better Environment v. Calif. Resources Agency* (2002) 103 Cal. App. 4th 98, 109.)

CEQA requires public agencies to avoid or reduce environmental damage when "feasible" by requiring "environmentally superior" alternatives and all feasible mitigation measures. (CEQA Guidelines § 15002(a)(2) and (3); See also, *Berkeley Jets*, 91 Cal. App. 4th 1344, 1354; *Citizens of Goleta Valley v. Board of Supervisors* (1990) 52 Cal.3d 553, 564) The EIR serves to provide agencies and the public with information about the environmental impacts of a proposed project and to "identify ways that environmental damage can be avoided or significantly reduced." (Guidelines §15002(a)(2)) If the project will have a significant effect on the environment, the agency may approve the project only if it finds that it has "eliminated or substantially lessened all significant effects on the environment where feasible" and that any unavoidable significant effects on the environment are "acceptable due to overriding concerns." (Pub.Res.Code § 21081; 14 Cal.Code Regs. § 15092(b)(2)(A) & (B))

I14-5 cont.

A prejudicial abuse of discretion occurs "if the failure to include relevant information precludes informed decisionmaking and informed public participation, thereby thwarting the statutory goals of the EIR process." (*San Joaquin Raptor/Wildlife Rescue Center v. County of Stanislaus* (1994) 27 Cal. App. 4th 713, 722]; *Galante Vineyards v. Monterey Peninsula Water Management Dist.* (1997) 60 Cal. App. 4th 1109, 1117; *County of Amador v. El Dorado County Water Agency* (1999) 76 Cal. App. 4th 931, 946)

2. The Project Has Significant, Unmitigated and Cumulative Impacts on Hydrology that Have Not Been Adequately Analyzed and Mitigated in the Draft EIS/EIR.

The Draft EIS/EIR fails to adequately analyze the impacts of the Project, and its potential to release hazardous substances into the subsurface environment, on local groundwater resources and surface water quality, and fails to provide an adequate analysis of the cumulative risks to geothermal resources from the Project and other geothermal extraction projects in the KGRA.

I14-6

a. The Draft EIR/EIS Fails to Adequately Analyze Impacts to Local Groundwater Resources.

The groundwater aquifer underlying the Project site is a critical source of potable drinking water for the Mammoth Lakes region, as documented by the Draft EIS/EIR. The Mammoth Community Water District (MCWD) produces water from the Mammoth Groundwater Basin to meet potable water needs of the Mammoth Lakes community. Mammoth Basin groundwater supply wells produce cold groundwater from the hydrologic region drained by the upper reaches of

I14-7

Mammoth Creek. MCWD installed the first production well in 1978, and as of 2011 used 9 production wells. (DEIR, p. 3.7-14, Section 3.19, Surface Water Hydrology). The Basin supplies the Mammoth Lakes community with groundwater for potable purposes with a total average production of 1.3 cubic feet per second (CFS). (*Id*; Exh. A, Rhymes comments at p. 2)

I14-7 cont.

Expert hydrogeologist Heidi Rhymes, PG, concluded that, although the water production wells are located in the western part of the groundwater basin, and are thus spatially separated from the geothermal wells, the location of the groundwater basin underlying *both* the water and geothermal wells, potential seismic activity from operation of the Project, and the nature of geologic activity in the region, create a significant risk of contamination of groundwater resources from leakage or mixing of geothermal extraction fluids. The Draft EIS/EIR fails to properly analyze these impacts.

I14-8

Ms. Rhymes explains:

The shallow groundwater system is separated from the underlying geothermal reservoir by either intense alteration of thick ash-rich Early Rhyolite units in the western caldera or low permeability rocks from a landslide which occurred in the south-central portion of the caldera from a catastrophic collapse approximately 760,000 years ago. The Mammoth Community Water District extracts groundwater from nine municipal wells, which are located primarily to the west and south of the project site. The groundwater depths in the wells range from 10 feet below ground surface (bgs) to 400 feet bgs.

The risk to the potable groundwater source from the proposed project lies in several areas. The first is that hazardous materials used in geothermal energy production are at risk of being released by accidents and man-made or natural disasters (i.e. earthquakes) into the shallow groundwater system. This can happen in multiple ways; either by an accidental release at the surface, by the contamination of injection fluids or by leaks within the extraction and injection system causing geothermal fluids and their associated chemicals to be released directly into the subsurface and underlying groundwater aquifer. The project area lies within and adjacent to the Hilton Creek fault – an Alquist Priolo Earthquake Fault Zone which defines known active faults, making the subsurface and groundwater vulnerable to accidental releases and contamination. Section 4.8.2 in the EIR/EIS indicates that mitigation GEO-6: "The CD-IV power plant and pipelines will be designed and constructed to reasonably minimize the potential for failure or rupture in the event of fault offset in these zones" is proposed to accommodate small to moderate level earthquakes but moderate to large earthquakes could result in serious groundwater

I14-9

I14-10

impacts. It is proven that geothermal extraction systems do increase the occurrence of earthquakes in the vicinity of injection wells for geothermal systems (Majer and Peterson, 2008) and (Nicholson and Wesson, 1990). Sanyal (2005) stated that "Prolonged, high pressure injection may induce seismic activity at a geothermal site, particularly if the fluid pressure is increased beyond the original pore pressure and if there are subsurface zones of weakness or active faults near the injection area. While the occurrence of microearthquakes near injection sites have been documented in several geothermal fields, such as The Geysers in California, no major earthquakes due to injection in a geothermal field has yet been reported." However Sanyal (2005) continues to state that major earthquakes have been documented as being induced by the petroleum and waste injection industries. Although only smaller earthquakes have been noted thus far resulting from the existing geothermal plants in California, larger earthquakes have occurred in other geothermal areas and have been linked to the geothermal injection process (Majer and Peterson, 2008).

I14-10 cont.

Another risk of injection is that there exists a decent connection between the geothermal reservoir and the shallow groundwater system and that mixing may occur to some extent. Well P-17, located west of the project site, has already shown evidence of mixing according to section 4.7.4.1 of the EIR/EIS. The extraction and injection of geothermal fluids can deflate or inflate the reservoir and this can increase the risk of mixing. In addition, when geothermal reservoirs are depleted they can leave behind interstitial spaces elevated in heavy metals and elevated concentrations could impact the groundwater source if a pathway exists or is later formed. When groundwater comes in contact with geothermal fluids or former geothermal-extraction areas it is often removed as a beneficial use for human consumption and deemed non-potable. According to Section 3.19.2 of the EIR/EIS, such is the case with the groundwater located in the southeast portion of the project area where the lines of mixing are too close and the water is not suitable for consumption. The impacts to the overlying shallow groundwater systems show early signs of mixing and the impacts to the environment and natural resources with a 50% increase in production of geothermal fluids in this area has not adequately been addressed in the EIR/EIS for this project.

I14-11

Furthermore, as stated in section 4.7.4.1 of the EIR/EIS the models used are proprietary and as such the results and reports could not be vetted by the public. To date the EIR/EIS fails to include a thorough and public review of the subsurface hydrologic processes for the proposed project and fails to adequately analyze how the geothermal reservoir is connected

I14-12

to the overlying strata and groundwater systems that could be impacted by this project. I14-12 cont.

(Exhibit A, pp. 2-4)

While the Draft EIR/EIS identifies the location of the wells in relation to each other, it fails to analyze these potential risks, relying on the distance between the water and geothermal wells, and past data of groundwater chemistry, to conclude that there is no significant risk posed to the Mammoth Groundwater Basin from the release of hazardous contamination from the Project. (See DEIR, p. 3.7-14) However, this analysis fails to account for the location of above-ground pipelines in relation to water well locations, fails to account for the natural mixing of groundwater within the basin, and relies on a lack of major seismic incidents in the 1996-2009 historical period discussed. (*Id.*) I14-13

The Draft EIS/EIR further purports to rely on proprietary models and studies conducted by the Applicant to reach its conclusions, which documents it failed to include in the Draft EIS/EIR or to disclose to the public. This is prohibited under both CEQA and NEPA. NEPA "requires agencies to provide the public with the underlying environmental data from which an agency expert derives his or her opinion." 40 C.F.R. §1502.24 *Siskiyou Regional Education Project v. Rose*, 87 F. Supp. 2d 1074, 1096 (D. Or. 1999) citing *Idaho Sporting Congress v. Thomas*, 137 F.3d 1146, 1150 (9th Cir. 1998); *Earth Island Inst. v. United States Forest Serv.*, 351 F.3d 1291, 1300-01 (9th Cir. 2003). "No material may be incorporated by reference unless it is reasonably available for inspection by potentially interested persons within the time allowed for comment." 40 C.F.R. §1502.21. Similarly, Section 21092(b)(1) of CEQA and CEQA Guidelines Section 15087(c)(5) require that "all documents referenced in the environmental impact report" be available for review and "readily accessible." I14-14

The potential impacts of a release of hazardous chemicals from leakage or mixing of geothermal motive fluids into the injection wells is analogous to the risks from dispersion of hazardous chemicals to groundwater from hydraulic fracturing ("fracking"), a technique using wellbores drilled into reservoir rock formations used to release petroleum, natural gas (including shale gas, tight gas, and coal seam gas), or other substances for resource extraction. (See Exhibit G) Fracking has been documented to cause significant environmental impacts, including contamination of ground water, the migration of gases and hydraulic fracturing chemicals to the surface, surface contamination from spills, and flowback. These impacts have resulted in adverse health effects to the public from exposure to these contaminants, and significant degradation of the natural environment. (*Id.*) I14-15

It is incumbent upon the CEQA and NEPA lead agencies to fully analyze the potential impacts to the Mammoth Lakes water resources from these forseeable risks, and to implement all feasible mitigation measures under CEQA to reduce them to a less than significant level. The Draft EIS/EIR must be revised to properly analyze these impacts, and to fully disclose the data upon which the agencies have relied to reach their conclusions. I14-16

b. The Draft EIS/EIR Fails to Adequately Address the Impacts from the Project on Surface Water Quality.

Operation of the Project is also likely to result in significant impacts to water quality from the injection of hazardous substances into the subsurface and potential surface releases of hazardous materials, as well as from storm water runoff. I14-17

Ad explained by Ms. Rhymes:

a) Impacts from the injection of hazardous substances into the subsurface. Surface water quality is critical to down river systems from the project area because these waters serve as important ecological and recreational resources. These resources are vulnerable to impacts from the existing and proposed project. For instance, according to Section 3.7.1.2 of the EIR/EIS in 1993 a leak of spent isobutene fuel in the existing Casa Diablo geothermal plant was accidentally released into the injection piping located above grade and the contaminated injection water was injected into the geothermal reservoir at approximately 1900 feet bgs. This chemical was subsequently detected up to 5 years later and 2 miles away at Hot Creek Gorge. Given the detection limits of isobutene and the distance the chemical travelled in the subsurface, in order to detect these chemicals up to 2 miles away and 5 years later the size of the leak had to have been more than a minor leak. The exact quantity accidentally injected was not indicated in the EIR/EIS. This accident demonstrated that a connection exists between the deeper reservoir and the shallow surface water systems and also indicates the continued and long-lasting impacts of mismanaged chemicals used in process operations at geothermal energy plants. As shown in Section 4.7.1 of the EIR/EIS the shallow geothermal system mixes with surface water in the area of Hot Creek and the presence of chemicals in these waters can have adverse impacts on the biological resources. Although the EIR/EIS addresses spill prevention problems it did not specifically detail how a future release of working fuel (isobutene or the equivalent) will be avoided in the future. The amount of geothermal energy being processed by the CD-IV project will increase production in this area 50% and therefore the risk and mitigations of a repeated release needs to be addressed. I14-18

b) Impacts from storm water runoff on surface water quality.
The Basalt Canyon drainage originates north and west of the project area and traverses the project area towards Mammoth Creek. With the addition of numerous new well pads, roads, and equipment comes an increase in storm water run off and thus an increase in total dissolved solids along with an increased potential for contaminated run-off from added vehicle and equipment loading. Although the EIR/EIS in Section 4.8.2 proposes mitigation HYD-1: "Appropriate erosion control measures will be used to control any offsite discharges, and the Project will adopt any relevant LRWQCB and USFS best management practices to prevent soil erosion, including the preparation of a SWPPP" the EIR/EIS fails to adequately address the impacts of this added construction on Mammoth Creek. Mammoth Creek is already listed as an impaired water-body on Regional Water Quality Control Board's Clean Water Act Section 303(d) list for TDS and metals (RWQCB, 2013). The pattern of sheet flow in this area traverses the extensive project area directly and as such it should be thoroughly analyzed and the current EIR/EIS fails to do this. Furthermore, because existing facilities already increase run-off in the project area the combined impacts from the proposed and existing facilities needs to be taken into account and the EIR/EIS fails to accomplish this.

I14-19

c. Increased risk to surface water quality from hazardous material releases.
The surface waters are also at risk from a release of hazardous materials from chemicals used on the project site. As noted in Section 2.2.7.6 of the EIR/EIS there will be large amounts (9,000 – 12,000 gallons) of n-pentane used in the proposed CD-IV process as well as other hazardous chemicals such as fuel, lubricants, transformer oil and other chemicals. These chemicals, even if properly contained, can be mismanaged as demonstrated above or be released in to the environment in the event of a large earthquake. The EIR/EIS does not adequately study nor address the risk of these releases to the receiving water-bodies. The EIR/EIS does not discuss the risk to these water-bodies in event of a serious ground-shaking event, which could occur in this tectonically active area. Because of the sensitive nature of the down river habitats the study of the impacts of a release of these specific chemicals into the surface water-bodies should be included in the EIR/EIS.

I14-20

(Exhibit A, pp. 4-6)

The potential for hazardous materials to contaminate both potable groundwater and surface water, and the relationship of these potential impacts on the human environment, are potentially significant impacts that must be analyzed

I14-21

under both CEQA and NEPA. See 40 CFR § 1508.14 ("When an environmental impact statement is prepared and economic or social and natural or physical environmental effects are interrelated, then the environmental impact statement will discuss all of these effects on the human environment."); PRC §§ 21000(b)(1); 21068 (an EIR must analyze all potentially significant impacts of a proposed project on the environment); 21060.5 ("Environment" means the physical conditions which exist within the area which will be affected by a proposed project, including land, air, water, minerals, flora, fauna, noise, objects of historic or aesthetic significance.")

I14-21 cont.

c. The Draft EIS/EIR Fails to Provide an Adequate Analysis or Thorough Review of the Risks, Including Cumulative Impacts, to Nearby Geothermal Resources from the Project, or to Analyze Subsidence Caused by The Project Over Time.

The Casa Diablo Project will contribute to reduction of geothermal temperatures within the KGRA and Mammoth Lakes area, which area is home to sensitive, temperature-dependent water resources, such as the Hot Creek Fish Hatchery, as well as tourism uses at nearby hot springs. For example, the Draft EIS/EIR estimates that the Casa Diablo Project will reduce the thermal flow to Hatchery Springs by about 17 percent, and thermal discharge from the Project is anticipated to cool up to 11 to 18 degrees Farenheit, resulting in production of less steam from the downstream discharge at Hot Creek. (DEIR, p. 4.7-7)

I14-22

Expert Rhymes concludes that the loss of heat within the KGRA basin from the Project, in conjunction with other geothermal extraction development in the area, is likely to have significant impacts on the region's geothermal resources, and that the Draft EIS/EIR fails to support its conclusions of no significant impacts with substantial evidence.

Ms. Rhymes states:

The proposed CD-IV project has the potential of impacting and irreversibly altering the natural geothermal features such as hot springs and pools, fumaroles (steam vents) and steaming ground in the vicinity of the project. As shown in Section 4.7.4.1 of the EIR/EIS water quality chemistry and temperatures indicate a clear connection from the Casa Diablo well field to the shallow geothermal features down flow from the site including Hot Creek Springs, Hot Bubbling Pool and Hot Creek Fish Hatchery. Reduction in temperatures of geothermal features can negatively impact the ecosystem and community resources. The rate of temperature decline (thermal drawdown) from the geothermal extraction/injection process in the reservoir exceeds the rate of recovery (Sutter, Fox et al., 2011) and although the process of geothermal energy is considered renewable

I14-23

reservoirs need "breaks" from extraction processes so that temperatures and pressures have time to recover to initial or close-to initial conditions. The decline in temperatures in a given system during the extraction and injection period will manifest themselves not only in the reservoir itself but also in the shallow geothermal features connected within the exploited reservoir. For this reason, as indicated in Section 4.7.4.1 of the EIR/EIS temperature declines are expected in the areas of concern for this project such as Hot Creek Springs, Hot Bubbling Pool, Hot Creek Fish Hatchery.

I14-23 cont.

As mentioned in Section 4.7.4.1 of the EIR/EIS the Applicant had a proprietary numerical model developed to simulate geothermal production and reservoir response, yet this model has not been reviewed by the public and thus the data cannot be validated. In addition, the mass balance equations used in the Section 4.7.4.1 of the EIR/EIS using Monitoring Well MBP-3 and Monitoring Well 44-16 seem to include only one sampling event from each well. The data is typically more reliable when data sets include more than one data point for each hypothesis, which this does not. The EIR/EIS in Section 4.7.4.1 indicates that at the lower forecast temperature slightly lower inflow temperatures are expected at the major surface manifestations. Again, since the data is proprietary and not available to analyze this cannot be confirmed. The term "slightly lower" is not quantified. The EIR/EIS in Section 4.7.4.1 indicates that the thermal discharge at the Hot Creek Fish Hatchery is forecast to be reduced by 0.85% and that the thermal outflow to Hatchery Springs will be reduced by about 17%. Thus, this area appears sensitive to changes in thermal inflow from the Casa Diablo reservoir and this area and the ecosystem it supports relies on adequate thermal input to survive. The EIR/EIS does not seem to adequately study the impacts of these lowered temperatures on the surrounding resources and furthermore what studies were done are not available for public review. Due to the importance of these geothermal resources to the community and the ecosystems the EIR/EIS process should demand a thorough study of these impacts and the current one fails to supply this.

I14-24

(Exhibit A, pp. 7-8)

Under CEQA, a project would cause adverse impacts to hydrological resources if it would "substantially deplete of alter geothermal outflow to surface water and geothermal manifestations." (DEIR, p. 4.7-2; CEQA Guidelines, Appendix G)

Additionally, an EIR must be prepared analyze cumulative impacts "if the cumulative impact may be significant and the project's incremental effect, though individually limited, is cumulatively considerable. 14 CCR § 15064. 'Cumulatively

I14-25

considerable' means that the incremental effects of an individual project are significant when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects." *Id.* at subs. (h)(1).

I14-25 cont.

The Draft EIS/EIR fails to adequately characterize or analyze these impacts, and must be revised accordingly.

The Draft EIS/EIR also fails to adequately address the impacts from project-related subsidence.

As explained by Ms. Rhymes:

> Subsidence is the sinking of the Earth's surface in response to geologic or human-induced causes. The scientific data as noted in Section 4.8.4 of the EIR/EIS shows that this area has undergone naturally occurring uplift in the resurgent dome and also subsidence. Subsidence was measured in this area, and although it is difficult to distinguish naturally occurring subsidence from those associated with geothermal extraction it is indicated in the EIR/EIS that subsidence does occur in isolated areas around the production wells. As noted in Section 4.8.4 on the EIR/EIS the USGS observed that the apparent amount of subsidence was limited and spatially related to the producing area around Casa Diablo. The subsidence totaled 310mm since 1997 however was balanced out by uplift from the resurgent dome. Although the configuration of wells for the CD-IV project are different than the existing project and reinjection of the cooling brine could help to reduce the degree of subsidence it should be expected that some degree of subsidence will be measured in the project area around the production wells. It is further noted that the rate of subsidence due from geothermal extraction will likely exceed the rate of uplift in the resurgent dome. This is because naturally occurring uplift typically takes thousands of years or more and the rate of subsidence from geothermal extraction is in the order of years and decades. Although the earthquake swarm in the caldera that occurred in the 1980's contributed to a rapid rate of uplift it is unlikely to repeat anytime soon and it is not expected that another uplift event will balance out any future subsidence from extraction during the length of this project. Subsidence in these areas can affect the integrity over time of the pipelines and other underground and aboveground facilities. Although the degree of subsidence is anticipated to be relatively minor, when combined with ground shaking events from the injection process, it could lead to compromised equipment which could lead to a release, either slow or catastrophic, of hazardous materials into the shallow groundwater system and/or surface waters. The EIR/EIS did not adequately address the risk to the public and the environment from

I14-26

impacts from subsidence when combined with ground shaking events that could occur from this project.

(Exhibit A at pp. 8-9)

These impacts must be addressed and mitigated in a Final EIS/EIR.

I14-26 cont.

d. The Draft EIS/EIR Fails to Adequately Analyze Potential Impacts from Project-Induced Seismicity.

The Draft EIS/EIR acknowledges that the potential of deeply penetrating geothermal wells to induce seismicity is a "prevalent public concern" (DEIR, p. 4.8-12), and admits that "seismicity has at times been induced by human activity, including the development of geothermal fields, through both production and injection operations (Geothermal Energy Association, 2007)." Past geothermal activity at other project sites has produced "[e]arthquakes with Richter magnitudes below 2 or 3." (*Id.*) These microearthquakes occur when geothermal fluids are injected back into the system, and are centered on the injection site. (*Id.*)

The Draft EIS/EIR concludes that these microearthquakes alone "are not considered to be a hazard to the geothermal power plants or the surrounding communities," but fails entirely to analyze the Project's potential to generate earthquakes of a higher magnitude, and also fails to characterize the Project's likelihood of increasing seismicity in the existing volatile Hilton Creek fault zone in which the Project is located.

I14-27

Ms. Rhymes concludes that this is a potentially significant impact that must be fully analyzed. She explains:

> It has been shown that the injection of fluids into an area that is tectonically active and that has active faults proximal to the injection area can increase the amount of earthquakes in that vicinity (Majer and Peterson, 2008). Section 4.8.4.1 of the EIR/EIS states that "Although earthquakes typically occur naturally, seismicity has at times been induced by human activity, including the development of geothermal fields, through both production and injection operations (Geothermal Energy Association, 2007). In these cases, the resulting seismicity has been low-magnitude events known as microearthquakes." Thus far, as indicated in Section of the EIR/EIS 4.8.4.1 it has only been smaller earthquakes which have been correlated with geothermal injection wells, however, it has been shown in previous studies by Nicholson and Wesson (1990) that when the volume of injection fluids into an area increases so too does that quantity and strength of the earthquakes. Components, including the proposed power

plant, substation, several wells and transmission lines, lie within the Hilton Creek fault zone. In 1980 several M+6 earthquakes occurred along this fault. As mentioned above, although previous geothermal injection activities in the existing geothermal plants in California have been linked to earthquakes they have not yet been large enough cause damage. However, as stated above as injection levels increase so does the frequency and magnitude of the earthquakes. The probabilistic seismic hazard assessment (PHSA) indicates that at the CD-IV project site there is a 10% chance of exceeding peak ground acceleration (PGA) values of 0.40g-0.50g over the next 50 years, depending on site specific ground conditions. According to the Modified Mercalli Intensity Scale an earthquake within this range is a very strong earthquake with slight damage to newer reinforced buildings, considerable damage in ordinary substantial buildings, great damage in poorly built structures, heavy furniture overturned, the fall of chimneys, factory stacks, columns and monuments. The EIR/EIS does not adequately address the increased seismic risk from the proposed injection activities combined with the already existing injection activities. A full-scale open review is needed of the impacts of the combined injections onto the existing risk of fault rupture in this area. The current EIR/EIS fails to address these issues.

(Exhibit A, pp. 10-11)

I14-27 cont.

An EIR is required to analyze a Project's potential to "expose people or structures to potential substantial adverse effects, including risk of loss, injury or death involving i) rupture of a known earthquake fault; ii) strong seismic ground-shaking; iii) seismic-related ground failure.." (DEIR, p. 4.8-14, CEQA Significance Criteria; see 14 CCR § 15126.2(a)) Additionally, an EIR must identify and describe the indirect environmental impacts that will result from the project. (14 CCR §§ 15126.6(a); 15064(d)(2). The Draft EIS/EIR fails to perform that analysis.

The Project's potential to increase seismicity in the Hilton Creek fault zone must be analyzed, and appropriate mitigations incorporated into the Project to minimize potential impacts on surrounding communities.

3. The Draft EIS/EIR Fails to Adequately Analyze Impacts to Biological Resources.

It is the policy of the State of California to

Prevent the elimination of fish or wildlife species due to man's activities, insure that fish and wildlife populations do not drop below self-

perpetuating levels, and preserve for future generations representations of all plant and animal communities.

(Pub. Res. Code § 21001(c).) An EIR may not avoid studying impacts to biological resources by proposing future study or mitigation based on future studies unless the mitigation measures and performance standards are explicit in the DEIR. (*San Joaquin Raptor Rescue Center v. County of Merced* (2007) 149 Cal.App.4th 645, 671)

Although NEPA does not specify specific environmental assessment measures for impacts on biodiversity, the Council on Environmental Quality ("CEQ") has commented that an agency's evaluation of impacts to biological resources in a NEPA document should expand beyond the commonly included concerns such as "(1) focus[ing] on species...(2) address[ing] the site scale...and (3) immediate short-term impacts" to consider impacts on "ecosystems of regional scale" and "likely future impacts." CEQ, "Incorporating Biodiversity Considerations Into Environmental Impact Analysis Under the National Environmental Policy Act" (1993).

There are numerous biological impacts that the reviewing agencies have failed to adequately analyze in the Draft EIS/EIR, including impacts to special status species, as well as habitat fragmentation and loss that will impact a range of both migratory species and indigenous forest species. I14-28

a. The EIR/EIS Fails to Provide Adequate or Accurate Information on Special-Status Wildlife Species that may be Adversely Affected by the Project. I14-29

Expert wildlife biologist Dr. Shawn Smallwood reviewed the Draft EIS/EIR and has concluded that it fails to properly analyze, characterize, and mitigate, significant impacts to a host of special status and specially protected animal species. He explains:

I disagree with most of the conclusions of occurrence potential of other special status species [besides northern goshawk]. For example, the bald eagle was given low potential to occur, because the DEIR/DEIS claimed that the project site does not offer foraging habitat. However, bald eagles forage in Crowley Lake, only 12 km away, and they likely forage in smaller water bodies within only 2-3 km from the project site. Bald eagles often roost in conifers nearby but not immediately adjacent to foraging areas, so it is not unreasonable to consider the project site as potentially useful to bald eagles. I14-30

I strongly disagree with the DEIR/DEIS that golden eagles are unlikely to occur at the project site (page 3.4-7). I have seen golden eagles foraging in

areas similar to the conditions at the project site. I have witnessed golden eagle's hunting in conifer forests by beating their wings against tree branches while descending slopes, apparently as an attempt to flush potential prey items. There is nothing about the project site that would limit golden eagle occurrence.

I14-30 cont.

The DEIR/DEIS attributed moderate potential for the occurrence of greater sage grouse, but I have been in greater sage grouse habitat many times, including at the project site. I do not see any reason why high occurrence potential should be attributed to greater sage grouse at the proposed project site.

I14-31

Prairie falcons were concluded to have low potential due to lack of habitat at the project site. I have observed prairie falcons many times during my surveys, including in partially forested environments. The project site is a mix of forest and sage scrub, so a conclusion of low potential was not warranted. Prairie falcons have a moderate to high potential for occurrence at the project site.

I14-32

In the absence of appropriate surveys, the DEIR/DEIS concluded that the occurrence potential was only moderate for two species of bats: Pallid bat and Townsend's big-eared bat. The DEIR/DEIS concluded that the occurrence potential was low for five species of bat: Silver-haired bat, Western red, Long-eared myotis, Long-legged myotis, and Yuma myotis. Little is known about the habitat use of these bats, because few studies have been performed. In the absence of appropriate surveys and scientific studies, the DEIR/DEIS was unjustified in concluding low or moderate occurrence potentials of these species. The prudent conclusion, and one that would be more consistent with the environmental protection objectives of CEQA, would be that all of these bat species likely use the project site.

I14-33

The DEIR/DEIS concluded only a moderate potential for Sierra Nevada red fox to occur at the project site, but there is nothing about the site that would discourage Sierra Nevada red fox from occurring there. During my statewide surveys for mountain lions, I recorded fox tracks on one of my transects, which happens to have been immediately adjacent to the project site. I have surveyed that transect seven times since 1985. In 1992, I recorded fox tracks, although I cannot be certain that these tracks were left by Sierra Nevada red fox (instead of gray fox). There is no reason why Sierra Nevada red fox would not occur at the project site, and my discovery of fox tracks in the area serves as potential evidence of their occurrence.

I14-34

> The DEIR/DEIS made no mention of American badger (*Taxidea taxus*), which is a California Species of Special Concern[4] (CSC). Nor did the DEIR/DEIS mention California mountain lion, which is a Specially Protected Species under state law. During my mountain lion surveys since 1985, I have detected tracks of both American badger and California mountain lion on my survey transect, only a mile or two from the proposed project site. I14-35
>
> The proposed project site supports multiple special-status species of wildlife, some of which the DEIR/DEIS acknowledged, and some of which it dismissed without sound scientific reasoning. The DEIR/DEIS concluded that the following special-status species of wildlife have the potential to occur on the project site: northern goshawk, greater sage-grouse, pallid bat, Townsend's big-eared bat, western white-tailed jackrabbit, Sierra Nevada red fox, and Sierra marten. To this list, I add American badger, California mountain lion, Silver-haired bat, Western red, Long-eared myotis, Long-legged myotis, and Yuma myotis, golden eagle, bald eagle, and prairie falcon. The project's impacts would be significant to at least 17 special-status species. I14-36

(Exhibit B, pp. 2-3)

b. Movement corridors and habitat fragmentation

The DEIR/DEIS did not discuss the project's contribution to habitat fragmentation, which is a process that has been recognized as the greatest threat to species' persistence in the wild (Wilcox and Murphy 1985). Habitat fragmentation results in the reduction of a net larger habitat area than can be measured by summing the remaining, apparent habitat patches (Wilcox and Murphy 1985, Saunders et al. 1991, Hall et al. 1997). The project, as proposed, would impose a sprawling barrier to wildlife movement due to the 6.5 acre power plant, an expanded well field totaling 45 acres, above-ground pipelines, 650 feet of new transmission totaling 0.75 acres of additional forest clearing, a new substation on 0.25 acres, 0.77 miles of new roadway, and 5.58 miles of road improvements. Furthermore, this sprawling addition of wildlife movement barriers is proposed to be oriented generally east-west across most of the low-lying portion of a natural movement corridor between the City of Mammoth Lakes and higher-elevation terrain to the east. Dr. Smallwood concludes that "the possible direct and cumulative impacts of this project as a movement barrier was not I14-37

[4] The California Department of Fish and Game continues to not list this species as CSC on its web site, but I have a copy of a letter from CDFG explaining that the listing omission was a mistake and that the American badger is indeed considered to be CSC.

discussed in the DEIR/DEIS, leaving it inadequate as a CEQA review document." (Exhibit B, p. 3)

I14-37 cont.

c. Cumulative Impacts on Species.

Dr. Smallwood concludes that the Draft EIS/EIR fails to adequately evaluate cumulative impacts of the Project on species when considered in conjunction with other reasonably forseeable development in the KGRA area, including human growth. He states:

I14-38

> What remains of a naturally-occurring, north-south, wildlife movement corridor will be impeded by the proposed project. The DEIR/DEIS should have mapped the locations and extent of existing human infrastructure, as well as proposed and likely future clearing of habitat and imposition of additional human infrastructure. A map of existing and conceivable future projects would most effectively inform the readers of the DEIS/DEIR of the likely cumulative effects of the project on wildlife movement through the area.

(Exhibit B, pp. 3-4)

d. Deficient Mitigation Measures and Mitigation Monitoring.

I14-39

The Draft EIS/EIR fails to incorporate all feasible mitigation measures, as required by CEQA, to lessen the Project's significant impacts on species.

Dr. Smallwood explains:

> Project design Measure 1: The DEIR/DEIS states that a wildlife biologist will walk the length of the new pipeline to look for signs of impedance of wildlife movement caused by the pipeline. However, the DEIR/DEIS needed to clarify how the monitor would determine whether the pipeline is impeding wildlife movement. More details are also needed, including the time of year the biologist would survey the pipeline, and what steps could be taken to reduce the impact, should an impact be detected.

I14-40

> Project design Measure 2: Thresholds of success need to be established, and monitoring to measure effectiveness needs to be designed and implemented. A performance bond should be established, and it should be linked to the thresholds of success.

I14-41

> Project design measures 3 through 7: The DEIR/DEIS was vague about who will be responsible for implementing the proposed measures. Who will be responsible for monitoring their implementation and effectiveness?

I14-42

WIL-2: Impacts could be minimized by removing accumulated water daily from lined well site basins, or by installing ramps. However, the DEIR/DEIS needs to include consequences for not taking these steps, and there needs to be mitigation monitoring to ensure that this measure is implemented. Again, a performance bond should be required, along with thresholds linked to these measures and consequences for not meeting the thresholds. I14-43

WIL-3: Whereas this measure would minimize impacts by retaining downed woody debris and snags to the degree feasible, it does nothing to offset project impacts. I14-44

WIL-4: Whereas it would be best to work with CDFG in designing and siting a new deer crossing, the DEIR/DEIS needs to identify an alternative plan in case the best-intended plan for a new deer crossing fails. Mule deer might not cooperate with the applicant's plan for a new deer crossing, or the crossing might be infeasible for reason(s) biologists do not understand. Again, a performance bond is needed for the project's impacts on mule deer movement patterns in the area, and monitoring linked to performance thresholds is needed. It needs to be explained what can and will be done should the new deer crossing fail. I14-45

WIL-5: Again, this measure looks reasonable as a logic exercise, but best laid plans do not always work out. A performance bond is needed, along with monitoring linked to thresholds of success, and along with alternative measures. I14-46

WIL-6: The DEIR/DEIS needs to be more explicit about what qualifies as a deer crossing or as a movement corridor. Is there a quantitative threshold of activity that can be added to the DEIR/DEIS? Leaving the definitions vague usually results in no action, in my experience. I14-47

WIL-7: Both pre- and post-construction surveys are needed for greater sage grouse, as well as for other special status species. These surveys are needed to detect project impacts, so that additional impact reduction measures can be taken, as well as compensatory mitigation. I14-48

The DEIR/DEIS proposed no compensatory mitigation of any kind. The project will reduce wildlife habitat, which should be mitigated. The project will also interfere with wildlife movement patterns, and this impact should also be mitigated through some form of compensation. I14-49

IV. MITIGATION MONITORING

It has long been known that mitigation pursuant to CEQA has often either failed or has not been implemented, but with no consequences to the take-permit holder (Silva 1990). There should be consequences for not achieving mitigation objectives or performance standards. The project proponents should be required to provide a performance bond in an amount that is sufficient for an independent party to achieve the mitigation objectives originally promised, and in this case, the promises should be much more substantial. A fund is needed to support named individuals or an organization to track the implementation of mitigation measures. Report deadlines should be listed, and who will be the recipients of the reports. In my professional opinion, the lack of specific mitigation monitoring details in the EIR/EIS renders it inadequate and uncertain, and makes it impossible to gauge whether or to what extent any mitigation measures will lessen potentially significant impacts on species, If these measures are not clearly laid out in the EIR/EIS, then there will be no basis to determine that impacts will be less than significant once implemented, and fail to provide enforceable performance measures by which the public and regulatory agencies can gauge their effectiveness. Furthermore, without adequate funding allocated in advance, there is no certainty that any proposed mitigation monitoring will actually take place. I14-50

(Exhibit B, pp. 4-5)

a. Impacts to the Hot Creek Zone and Fish Hatchery.

The Casa Diablo well field has a clear connection to the shallow geothermal features down flow from the site including Hot Creek Springs, Hot Bubbling Pool and Hot Creek Fish Hatchery. (DEIR, p. 4.7.4.1; Exhibit A, H. Rhymes, p. 7) The reduction in geothermal temperatures resulting from Project operation is likely to contribute to reductions in temperatures in Hot Creek, which may have adverse effects on temperature-sensitive species at the Fish Hatchery, as well as on the federally listed Owens tui chub, which has designated critical habitat in the vicinity of the Project site, and has been estimated by expert biologists to occur within approximately 2 miles from the Project site. (See Exhibit F, Comments of Scott Cashen, M.S. re MP-I Project) I14-51

As a result of the forgoing deficiencies, the Draft EIS/EIR must be revised to reassess impacts to biological resources and, where appropriate, propose adequate mitigation measures with definite terms and verifiable performance standards. I14-52

4. The Draft EIS/EIR Fails to Adequately Analyze The Project's Air Quality and Odor Impacts, and Renders the Project Inconsistent with the Air Quality Provisions of Mono County's General Plan.

The Casa Diablo Project area is located in the Great Basin Valleys Air Basin ("GBVAB") which encompasses Mono, Inyo and Alpine Counties, and is subject to regulation by Great Basin Unified Air Pollution Control District ("GBUAPCD"), the local air district for the MP-I Project area. (DEIR at p. 3.2-1-3.2-3) The Project area is located in the Mammoth Lakes Air Quality Planning Area of the GBVAB which is a Federal nonattainment-moderate area for 24-hour particulate matter equal to or less than 10 microns in aerodynamic diameter ("PM10"), and is within a State designated nonattainment area for both PM10 and ozone. (Id.)

The Project would be required to obtain an Authority to Construct permit from the GBUAPCD for a binary geothermal power plant unit. The Project would also be required to obtain separate Permits to Operate for each piece of fuel burning stationary equipment that would be operated on the site (e.g., diesel-fueled emergency generator and firewater pump generator). (DEIR, pp. ES-1, 1-2)

The Project area is in a study area classified as moderate non-attainment for the federal 24-hour PM10 AAQS. In addition, although currently classified as attainment, PM2.5 concentrations in the GBVAB have exceeded the federal 24-hourstandard in recent years (see Section 3.2.1.3, Criteria Air Pollutants). Therefore, the applicable federal Clean Air Act conformity de minimis level (i.e., 100 tons per year) for PM10 and PM2.5 is used as a measure as to whether the Proposed Action or one of the Action Alternatives could result in an exceedance of a federal NAAQS. The study area is also classified as non-attainment for the state 1-hour and 8-hour ozone AAQS as well as the 24-hour PM10 AAQS. The GBUAPCD has not developed specific significance thresholds for construction or operation emissions. (DEIR, pp. 4.2-5-6)

a. Agencies' Duty to Analyze and Mitigate Significant Air Quality Impacts.

Under CEQA, an EIR must fully disclose the potentially significant impacts to regional air quality and health impacts on residents and construction workers from a proposed project. (*See Communities for a Better Environment v. South Coast Air Quality Management Dist.* (2010) 48 Cal. 4th 310, 317 (refinery CEQA document inadequate for failure to analyze nitrogen oxide emissions, known to have significant effects on human health); *Berkeley Keep Jets Over the Bay Com. v. Bd. of Port Comrs.* (2001) 91 Cal.App.4th 1344, 1369 (EIR must include a "human health risk assessment" to address impacts from exposure to toxic air

I14-53

contaminants); *see also Bakersfield Citizens for Local Control v. City of Bakersfield* (2004) 124 Cal.App.4th 1184, at 1219-20 ("the health consequences that necessarily result from the identified adverse air quality impacts.... On remand, the health impacts resulting from the adverse air quality impacts must be identified and analyzed in the new EIR's."))

Under NEPA, a federal agency is required to evaluate possible mitigation measures in defining the scope of the EIS, in examining impacts of the proposed action and alternatives, and in explaining its ultimate decision. *See* 40 C.F.R. §§ 1502.14(f), 1502.16(h), 1505.2(c), 1508.25(b). The EIS must take a "hard look" at the environmental impacts of proposed major federal actions and provide a "full and fair discussion" of those impacts. 40 C.F.R. § 1502.1; *see also National Parks & Conservation Ass'n v. Babbitt*, 241 F.3d 722, 733 (9th Cir. 2001).

Independent of NEPA, federal Clean Air Act ("CAA") section 176 requires federal agencies that are funding, permitting, or approving an activity to ensure the activity conforms to the applicable SIP adopted to eliminate or reduce air quality violations. 42 USC §7506.

I14-53

Additionally, CAA Section 309 authorizes review and comment by the EPA Administrator on "the environmental impact of any matter relating to [its] duties and responsibilities. 42 USC §7609. As applied to NEPA, Section 309 provides in relevant part:

> Environmental impact. The Administrator shall review and comment in writing on the environmental impact of any matter relating to duties and responsibilities granted pursuant to this Act or other provisions of the authority of the Administrator, contained in any (1) legislation proposed by any Federal department or agency, (2) newly authorized Federal projects for construction and any major Federal agency action (other than a project for construction) to which section 102(2)(C) of NEPA applies... In the event the Administrator determines that any such legislation, action, or regulation is unsatisfactory from the standpoint of public health or welfare or environmental quality, he shall publish his determination and the matter shall be referred to the Council on Environmental Quality. 42 USC §7609(a), (c).

Although an unsatisfactory Section 309 determination by EPA does not per se bar an agency from proceeding with approvals for a project, Section 309 is intended to do "something more" than Section 102(2)(C) of NEPA, which requires the transmittal of impact statements to the CEQ. Any determination by EPA on the Project's significant air quality impacts must be given great weight by the reviewing agencies in this Joint EIS/EIR.

b. There is Substantial Evidence that the Project Will Have Significant Air Quality Emissions in Excess of State and Federal Standards.

Atmospheric expert Dr. James Clark has reviewed the Draft EIS/EIR, and concludes that was issued prematurely, without considering the serious flaws in the Proponent's own analysis of the project. Dr. Clark concludes that the Draft EIS/EIR fails in the following respects: I14-54

1. failure to provide a clear description of the project;
2. failure to perform an adequate air quality analysis;
3. failure to adequately estimate the air quality burden the project will place on the air basin;
4. failure to perform an odor analysis; and
5. failure to perform an adequate GHG analysis.

(Exhibit C, p. 4)

Dr. Clark provides the following analysis:

I. Failure To Provide Clear Description Of Project

The proponent fails to adequately describe the size and scope of the project, which must be viewed as a component of a larger existing facility. The MPLP Geothermal Complex currently includes 3 existing generating stations: the 14 MW Mammoth Pacific I unit (MP-1), the 15 MW Mammoth Pacific II unit ("MP-II"), and the 15 MW PLES-I unit ("PLES-I") – totaling 44 MW in "net" generating capacity at the site.

The proponent of the project has also proposed to replace the MP-1 facility with a new structure. If both the MP-1 and Casa Diablo IV facility projects are approved, the Applicant will increase the total gross generating capacity of the Casa Diablo Geothermal Complex from 44 MW to up to 96 MW. Therefore, the actual potential Project involves the addition of 52 MW of generation to the existing complex. The parsing of the project into different DEIS/DEIR fails to meet CEQA's requirements for a complete description of the project. The proponent must analyze the impact the CD-IV Project will have on the whole MPLP Geothermal Complex, rather than parsing the project piecemeal in separate DEIRs. I14-55

II. The DEIS/DEIR Fails To Adequately Screen The Project Impacts When They Fail To Adequate Describe The Project And The Project Components.

The CEQA Guidelines, Appendix G, establish that impacts on air quality would be "significant" if a project would violate any ambient air quality standard or substantially contribute to an existing or projected violation of an ambient air quality standard. To determine whether such violations occur, it is common practice for lead agencies to compare ***project*** emissions to quantitative significance thresholds developed by local air districts as a screening tool for CEQA review.

Thresholds of significance for construction emissions are typically expressed on a short-term basis, *i.e.* daily or hourly basis to adequately capture impacts due to the high variability of emissions during different construction stages. The Project site is under the jurisdiction of the GVAPCD, which has not developed significance thresholds for construction like most other air districts. Given the lack of quantitative significance thresholds in the GVAPCD's guidance, the Proponent could have conducted ambient air quality dispersion modeling to evaluate whether ambient air quality standards would be violated during any of the construction phases. I14-56

The CD-IV Project is located in the Great Basin Valleys Air Basin (GBVAB), which includes Mono, Inyo, and Alpine Counties. Mono County is designated non-attainment for the federal and state standards for ozone and PM_{10}. Mono County is also has the highest population density of all the counties in the GBVAB, with the Town of Mammoth Lakes having the greatest population in the county. In the absence of quantitative significance thresholds from GVAPCD, the Proponent has used short-term significance thresholds developed by another air district, the Imperial County Air Pollution Control District (ICAPCD) to screen for significance of criteria pollutant emissions.

The Proponent notes that the Imperial County is a rural county similar to Mono County with existing and proposed geothermal development projects. The Imperial County Air Basin is also a federal and state non-attainment area for both ozone and particulate matter less than 10 microns (PM_{10}).[5] The majority of air basins in California are a federal

[5] BLM. 2012. Casa Diablo IV Geothermal Development Project Public Draft Joint Environmental Impact Statement and Environmental Impact Report. State Clearinghouse No. 2011041008. Pg 4.2.-6

and state non-attainment area for both ozone and PM_{10}, including the basins immediately adjacent to GBVAB (the Mountain Counties, San Joaquin Valley, and Mojave Desert). What the proponent does not note is that ICAPCD has some of the highest published significance thresholds for particulate matter less than 10 microns (PM10) in the State of California.

Table 1:
CEQA significance thresholds for construction emissions from various air districts

Air district construction thresholds*	NOx (lbs/day)	ROG (lbs/day)	PM_{10} (lbs/day)	DPM (lbs/day)	$PM_{2.5}$ (lbs/day)	CO (lbs/day)
ICAPCD	55	55	150			550
BAAQMD	54	54	82		54	
SCAQMD	100	75	150		55	550
EDCAPCD	82	82				
SLOCAPCD				7		
MBUAPCD			82			550
FRAQMD	25	25	80			
SMAQMD	85					
YSAQMD	82	82	150			

ICAPCD = Imperial County Air Pollution Control District, CEQA Handbook, 2007;
SCAQMD = South Coast Air Quality Management District, CEQA Handbook, 1993;
BAAQMD = Bay Area Air Quality Management District, CEQA Guidelines 2009;
EDCAPCD = El Dorado County Air Pollution Control District, CEQA Guide, February 2002;
SLOCAPCD = San Louis Obispo County Air Pollution Control District, CEQA Air Quality Handbook, December 2009.
MBUAPCD = Monterey Bay Unified Air Pollution Control District, CEQA Air Quality Guidelines, June 2004,
FRAQMD = Feather River Air Quality Management District, http://www.fraqmd.org/CEQA_Thresholds.htm;
SMAQMD Sacramento Metropolitan Air Quality Management District, Guide to Air Quality Assessment, July 2004;
YSAQMD, Yolo-Solano Air Quality Management District, Air Quality Handbook, Guidelines for Determining Air Quality Thresholds of

I14-56 cont.

Significance and Mitigation Measures for Proposed Development Projects that Generate Emissions from Motor Vehicles, revised 2002

Given the proximity of the major population center for Mono County (the Town of Mammoth Lakes) to the proposed project and the existing air quality burden that exists in the County, it would be prudent to use a lower significance threshold than the one proposed by the Proponent. Proponents should re-evaluate the potential impacts using a more conservative/health protective significance threshold in a Supplemental EIR (SEIR). I14-56 cont.

III. Failure To Perform An Adequate Air Quality Analysis

The DEIS/DEIR's air quality analysis is deficient and must be updated in a SEIR. The analysis fails to: (1) adequately characterize the potential impacts from construction activities; and, (2) analyze potential health risks from HAPs during the operational phase of the project. Therefore, a revised EIR should be prepared to include a thorough evaluation of all air quality issues associated with the project. I14-57

(1) The DEIS/DEIR fails to accurately estimate the potential emissions from construction activities for the Project. Proponents rely on emissions factors that are assumed to include typical control measures presumptively, producing lower than emissions than previously assumed.

A. The Emission Factors Used To Calculate PM_{10} Emissions Are 71% Lower Than Factors Published By USEPA

Using the U.S. EPA's AP-42[6] emission factor for construction related emissions of total suspended particulate of 1.2 tons per acre per month of activity. The California Air Resource Board (CARB) estimates that 64% of construction-related total suspended particulate emissions is PM_{10}. This yields the following **emission factors for uncontrolled construction-related PM_{10} emissions:** I14-58

- 0.77 tons per acre per month of PM_{10}, or
- 51 lbs. per acre per day of PM_{10}.

[6] U.S. EPA. 1995. Compilation of Air Pollutant Emission Factors, Volume I: Stationary, Point and Area Sources, AP-42, 5th Edition, January 1995 for further information

The emission factors utilized in the construction analysis performed by the Proponent were compiled by the Midwest Research Institute (MRI) under contract to the PM_{10} Best Available Control Measure (BACM) Working Group. According to CARB, the bulk of the operations observed by MRI were site preparation-related activities.[7] The site estimates were combined with operation-specific emission factors from USEPA's AP-42 to produce an overall "average" emission factor of 0.11 tons PM_{10}/acre-month. CARB notes this was 71% lower than AP-42's 4th edition value.[8] As a daily emission factor, the MRI's average emission factor (0.11 tons PM_{10}/acre-month) is equivalent to 10 lbs PM_{10}/acre-day.

I14-58 cont.

What proponents do not indicate in their analysis is that the MRI's value assumes the effects of typical control measures such as routine watering. A dust control of 50% is assumed for these measures. The MRI value therefore underestimates the potential emissions from construction activities.

B. The Emission Factors Used To Calculate PM_{10} Emissions Should Have Included A Worst Case Scenario Emission Factor Value Which Is Approximately 4 Times Higher

I14-59

According to the CARB,[9] the MRI report also included an emission factor for worst-case emissions of 0.42 tons PM_{10}/acre month emission factor, the MRI's worst-case emission factor (0.42 tons PM_{10}/acre-month) is equivalent to 38.18 lbs PM_{10}/acre-day.

CARB notes that the worst-case emission factor is appropriate for large-scale construction operations, which involve substantial earthmoving operations.[10] The worst case scenario value has been

[7] CARB. 2002. Emission Inventory Source, Building Construction Dust. pg 7.7-2 http://www.arb.ca.gov/ei/areasrc/fullpdf/full7-7.pdf

[8] CARB. 2002. Emission Inventory Source, Building Construction Dust. pg 7.7-2 http://www.arb.ca.gov/ei/areasrc/fullpdf/full7-7.pdf

[9] CARB. 2002. Emission Inventory Source, Building Construction Dust. pg 7.7-2 http://www.arb.ca.gov/ei/areasrc/fullpdf/full7-7.pdf

[10] CARB. 2002. Emission Inventory Source, Building Construction Dust. pg 7.7-2 http://www.arb.ca.gov/ei/areasrc/fullpdf/full7-7.pdf

utilized by SCAQMD to sites that involve substantial earthmoving operations.[11]

Table 4.2-3 of the DEIS/DEIR, shows the maximum day emissions (in pounds per day) for the project as 98 lbs per day. This assumes all three phases of construction (power plant construction, well construction, and pipeline construction) occur simultaneously. Appendix C -1 of the DEIS/DEIR, indicates in Section 5 (page C-9) that 49.8 lbs of the emissions come from fugitive dust from trucks on unsaved roads. The remaining 35 lbs of PM_{10} comes from construction activities.

Using the more conservative worst-case emission factor for PM_{10} emissions from construction, the 35 lbs of fugitive dust from construction activities increases to 133.63 lbs per day. The cumulative fugitive (fugitive dust from construction and traffic) is therefore as high as 183.43 lbs per day. This value exceeds all of the regulatory thresholds of significance shown in Table 1. The proponent must re-evaluate using the worst-case emission factor or use USEPA's factor.

I14-59 cont.

(2) The proponents have failed to analyze potential health risks from hazardous air pollutants (HAPs) during the operational phase of the project. Proponents state that health risks are assessed qualitatively and full health risk assessment was not warranted.[12] Although they acknowledge the potential of releases of hydrogen sulfide or H_2S from drilling activities and diesel exhaust from construction equipment, Proponents fail to acknowledge that there are health consequences from short-term exposures to these chemicals and that they may be transported long distances.

Hydrogen sulfide, H_2S, is a known respiratory irritant and hazardous air pollutant (HAP). Diesel exhaust contains nearly 40 toxic substances including toxic air contaminants (TACs) and may pose a serious public health risk for residents in the vicinity of the facility. TACs are airborne substances that are capable of causing short-term (acute) and/or long-term (chronic or carcinogenic, i.e., cancer causing) adverse human health effects (i.e., injury or illness). TACs include both organic and

[11] CARB. 2002. Emission Inventory Source, Building Construction Dust. pg 7.7-2 http://www.arb.ca.gov/ei/areasrc/fullpdf/full7-7.pdf

[12] BLM. 2012. Casa Diablo IV Geothermal Development Project Public Draft Joint Environmental Impact Statement and Environmental Impact Report. State Clearinghouse No. 2011041008. Pg 4.2.-4

inorganic chemical substances. The current California list of TACs includes approximately 200 compounds, including particulate emissions from diesel-fueled engines.

Evidence exists that clouds of soot emitted by heavy-duty construction equipment can travel downwind for miles, then drift into heavily populated areas. For example, health impact studies from the South Coast Air Quality Management District[13] (SCAQMD) have documented that diesel emissions travel miles from the sources impacting residents.

Diesel exhaust has been linked to a range of serious health problems including an increase in respiratory disease, lung damage, cancer, and premature death[14,15,16]. Fine diesel particles are deposited deep in the lungs in the smallest airways and can result in increased respiratory symptoms and disease; decreased lung function, particularly in children and individuals with asthma; alterations in lung tissue and respiratory tract defense mechanisms; and premature death.[17] Exposure to diesel exhaust increases the risk of lung cancer. It also causes non-cancer effects including chronic bronchitis, inflammation of lung tissue, thickening of the alveolar walls, immunological allergic reactions, and airway constriction.[18]

I14-59 cont.

[13] SCAQMD MATES I, II, and III have documented the impacts for DPM in the SCAB.

[14] California Air Resources Board, Initial Statement of Reasons for Rulemaking, Proposed Identification of Diesel Exhaust as a Toxic Air Contaminant, Staff Report, June 1998.

[15] U.S. EPA, Health Assessment Document for Diesel Engine Exhaust, Report EPA/600/8-90/057F, May 2002.

[16] Environmental Defense Fund, Cleaner Diesel Handbook, Bring Cleaner Fuel and Diesel Retrofits into Your Neighborhood, April 2005; http://www.edf.org/documents/4941_cleanerdieselhandbook.pdf, accessed March 27, 2008.

[17] California Air Resources Board , Initial Statement of Reasons for Rulemaking, Proposed Identification of Diesel Exhaust as a Toxic Air Contaminant, Staff Report, June 1998.

[18] Findings of the Scientific Review Panel on The Report on Diesel Exhaust as adopted at the Panel's April 22, 1998 Meeting.

A recent analysis found that air pollution from diesel construction equipment is already taking a heavy toll on the health and economic well-being of Californians.[19,20]

In addition to potential releases of H_2S, the project could produce large quantities of ammonia. [21] Ammonia released to the environment has the potential during normal operation to create significant secondary particulate impacts. Ammonia emitted by the Project can react with sulfite ("SO_3") and nitrogen dioxide ("NO_2") downwind in the atmosphere to form ammonium sulfate, ammonium bisulfate, and ammonium nitrate according to the following reactions. (Seinfeld and Pandis 1998, pp. 529-534;[22] Matsuda *et al.* 1982;[23] Burke and Johnson 1982.[24])

I14-59 cont.

$$SO_3 + 2\ NH_3 \rightarrow (NH_4)_2SO_4 \quad (1)$$
$$SO_3 + NH_3 \rightarrow NH_4HSO_4 \quad (2)$$
$$NO_2 + OH + NH_3 \rightarrow NH_4NO_3 \quad (3)$$

The increase in PM in the region will only exacerbate the already serious air quality issues in the region.

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[19] These estimates are conservative because they do not include emissions from a large number of small construction projects (residential and commercial and projects smaller than 1 acre in size). Further, John Hakel, vice president of the Associated General Contractors, which represents construction equipment fleet owners and general contractors, indicated that the report appeared to underestimate the sheer volume of construction equipment.

[20] Union of Concerned Scientists, Digging up Trouble: Construction Pollution in the Bay Area; http://www.ucsusa.org/assets/documents/clean_vehicles/Bay-Area-Fact-Sheet.pdf, accessed March 27, 2008.

[21] J.M. Burke and K.L. Johnson, Ammonium Sulfate and Bisulfate Formation in Air Preheaters, Report EPA-600/7-82-025a, April 1982.

[22] John H. Seinfeld and Spyros N. Pandis, Atmospheric Chemistry and Physics, John Wiley & Sons, Inc., New York, 1998.

[23] S. Matsuda, T. Kamo, A. Kato, and F. Nakajima, Deposition of Ammonium Bisulfate in the Selective Catalytic Reduction of Nitrogen Oxides with Ammonia, Ind. Eng. Chem. Prod. Res. Dev., v. 21, 1982, pp. 48-52.

[24] J.M. Burke and K.L. Johnson, Ammonium Sulfate and Bisulfate Formation in Air Preheaters, Report EPA-600/7-82-025a, April 1982.

IV. Failure to Perform An Odor Analysis

According to the DEIS/DEIR odor impacts were identified as less than significant requiring no further analysis. Existing sources of odors that could affect the proposed project were not properly identified. The project has the potential to release large quantities of hydrogen sulfide, H_2S, a known irritant.

CARB investigated the ability of H_2S to cause annoyance to the general population. This study (CARB 1985,[25] p. 2), concluded that "an unpleasant odor is at or above the threshold of annoyance for half the people, when its concentration reaches 5 times the average threshold of detection." Recent work using reliable test methods indicates that the detectable threshold for H_2S ranges from 0.4 $\mu g/m^3$ (in studies in the Netherlands using a dynamic flow method) to 0.7 $\mu g/m^3$ (in studies in Japan using a static test method in an odor-free test room[26]). Thus, the concentration of H_2S that would annoy half the people would range from 2 $\mu g/m^3$ to 3.5 $\mu g/m^3$. I14-60

This is consistent with conclusions reached by the World Health Organization ("WHO"), which "considered that a level of 0.008 mg/m^3 (0.005 ppm) averaged over 30 min should not produce odour nuisance in most situations." [27] Extrapolating this to a 1-hour averaging time, this is equivalent to 3.5 $\mu g/m^3$ for a 1-hour exposure. These values are consistent with the annoyance range of 2 to 3.5 $\mu g/m^3$ estimated using CARB guidance.

The Proponent must adequately document the sources of potential odors, perform dispersion modeling of the sources to determine the ground level concentrations in the affected community, and determine

[25] John E. Amoore, The Perception of Hydrogen Sulfide Odor in Relation to Setting an Ambient Standard, Prepared for California Air Resources Board, ARB Contract A4-046-33, April 10, 1985.

[26] Y. Hoshika and others, International Comparison of Odor Threshold Values of Several Odorants in Japan and in The Netherlands, Environmental Research, v. 61, 1993, pp. 78–83.

[27] World Health Organization, Hydrogen Sulfide, Environmental Health Criteria No. 19, 1981, p. 13; National Research Council, Hydrogen Sulfide, University Park Press, Baltimore, 1979; T. Lindvall, On Sensory Evaluation of Odors Air Pollutant Intensities, Nord. Hyg. Tidskr., Supplement v. 2, 1970, pp. 1-181.

the frequency of exceedances in the community from the releases at the project. This information must be included in a SEIR. I14-60

(Exhibit C, pp. 5-14)

a. Fugitive N-Pentane Emissions will Result in Excess Emissions of VOCs/ROGs[28] In Violation of the Project's Own Selected Significance Thresholds.

The Draft EIS/EIR admits that the Project's fugitive n-pentane emissions will substantially exceed even the generous Imperial County Air Pollution Control District ("ICAPCD") CEQA significance threshold. The EIS/EIR states "[t]he fugitive n-pentane, which is considered an ROG (reactive organic gas), would be released to the atmosphere or would leak into the geothermal lines, as a result of fugitive leaks of vaporized n-pentane from the valves, connections, seals, and tubes of the closed power plant motive fluid system. (DEIR, p.4.2-4) The Applicant has estimated a maximum fugitive n-pentane leak rate for the CD-IV Project of 410 lbs/day (74.825 tons/year), and has requested this amount as permit limit from the GBUAPCD. (*Id.*) I14-61

The Project's own 410 lbs/day estimate vastly exceeds the ICAPCD operational emissions of ozone precursor ROGs of just 55 lbs/day (almost 8 times higher), and is almost double the GBUAPCD's best available control technology ("BACT") threshold of 250 lbs/day for VOC emissions from stationary sources. (DEIR, p. 4.2-6; Exhibit C, Clark Comments, p. 13; see Exhibit F, Pless Comments on MP-I Project) Furthermore, the Draft EIS/EIR fails to disclose and document the basis for its calculations fugitive n-pentane emissions, rendering it impossible to evaluate its accuracy.

The Draft EIR/EIS must be revised to fully analyze and mitigate this per se significant impact.

b. The Project's Excess Air Quality Emissions Will Violate the County's General Plan.

State law requires each county to adopt a long-term general plan governing development in all unincorporated areas. (Gov. Code §65300; *Napa Citizens for Honest Gov't*, 91 Cal. App. 4th at 352) The general plan sits at the top of the land use planning hierarchy (*DeVita v. County of Napa* (1995) 9 Cal.4th 763, 773), and serves as a "constitution" or "charter" for all future development. I14-62

[28] All references herein to Volatile Organic Compounds ("VOCs") refer equally to reactive organic compounds ("ROGs").

(*Lesher Commc'ns v. Walnut Creek* (1990) 52 Cal.3d 531, 540) General plan consistency is "the linchpin of California's land use and development laws; it is the principle which infused the concept of planned growth with the force of law." (*deBottari v. Norco City Council* (1985) 171 Cal. App. 3d 1204, 1213)

State law mandates two levels of consistency. First, a general plan must be internally or "horizontally" consistent: its elements must "comprise an integrated, internally consistent and compatible statement of policies for the adopting agency." (Gov. Code § 65300.5; *Sierra Club v. Bd. of Supervisors* (1981) 126 Cal. App. 3d 698, 704) A general plan amendment thus may not be internally inconsistent, nor may it cause the general plan as a whole to become internally inconsistent. (*DeVita*, 9 Cal. 4th at 796, n. 12) Second, state law requires "vertical" consistency, meaning that zoning ordinances must be consistent with the general plan. (See § 65860(a)(2); *Neighborhood Action Group v. Calaveras* (1984) 156 Cal. App. 3d 1176, 1184) Consistency is found when "[t]he various land uses authorized by the ordinance are compatible with the objectives, policies, general land uses, and programs specified in the [general] plan." (*Id.* at (a)(2))

I14-62 cont.

A project cannot be found consistent with a general plan if it conflicts with a general plan policy that is "fundamental, mandatory, and clear," regardless of whether it is consistent with other general plan policies. (*Endangered Habitats League v. County of Orange* (2005) 131 Cal. App. 4th 777, 782-83; *Families Unafraid to Uphold Rural El Dorado County v. Bd. of Supervisors* (1998) 62 Cal. App. 4th 1332, 1341-42) Any subordinate land use action that is not consistent with a city's current general plan is "invalid at the time it is passed." (*Lesher*, 52 Cal. 3d at 544) Findings that a zoning ordinance is consistent with its general plan must be reversed if they are based on evidence from which no reasonable person could have reached the same conclusion. (*A Local & Reg'l Monitor v. Los Angeles* (1993) 16 Cal. App. 4th 630, 648)

The Draft EIS/EIR admits that the Project will violate the General Plan as a result of violations of state or federal air quality standards. It states:

> The Mono County General Plan Conservation/Open Space Element provides direction specific to geothermal exploration and development via the Energy Resources Section. Objective G of Goal 1 establishes requirements to prevent violations of state or federal air quality standards or the rules and regulations of the GBUAPCD, and would be applicable to the CD-IV Project. Objective G states that "The permit holder shall establish procedures that ensure that neither geothermal exploration nor development will cause violations of state or federal ambient air quality standards or the rules and regulations of the GBUAPCD." (Mono County, 2012) (DEIR, p. 3.2-8; See Exhibit I)

The comments of Dr. Clark constitute substantial evidence that the Project, as currently proposed, will contribute to and may in fact cause exceedences of applicable state or federal air quality standards, thereby rendering the Project inconsistent with the General Plan.

I14-62 cont.

5. The Alternatives Analysis Is Inadequate.

NEPA requires that an EIS "[r]igorously explore and objectively evaluate all reasonable alternatives" so that "reviewers may evaluate their comparative merits." 42 U.S.C. §4332; 40 C.F.R. § 1502.14. Furthermore, "[a]n agency may not define the objectives of its action in terms so unreasonably narrow that only one alternative among the environmentally benign ones in the agency's power would accomplish the goals of the agency's action, and the EIS would become a foreordained formality." *NPCA v. BLM*, 606 F.3d at 1070 (internal quotations and citations omitted). "The existence of a viable but unexamined alternative renders an environmental impact statement inadequate." *Friends of Yosemite Valley v. Kempthorne*, 520 F.3d 1024, 1038 (9th Cir. 2008).

I14-63

To comply with CEQA, agencies must consider a "reasonable range" of alternatives. CEQA Guidelines §15126.6(a); *Village of Laguna Beach, Inc. v. Board of Supervisors* (1982) 134 Cal.App.3d 1022, 1028. A project cannot be approved if its significant impacts can be feasibly reduced to insignificance through project alternatives or mitigation measures. P.R.C §§ 21002, 21081.

The Draft EIS/EIR presents an inadequate and conclusory analysis of eliminated Project alternatives, and analyzes an imperissibily narrow range of alternatives that are nearly identical to each other. This fails to satisfy NEPA's "reasonable range of alternatives" requirement. *See Klamath-Siskiyou Wildlands Ctr. v. United States Forest Serv.*, 373 F. Supp. 2d 1069 (E.D. Cal. 2004) (range of timber harvest project alternatives rejected by court where too narrow or identical).

The Draft EIS/EIR analyzed 4 alternatives, and considered but did not analyze an additional 3 alternatives.

Alternatives analyzed include:

1. Alternative 1 – Proposed Action Alternative: This alternative was developed by ORNI 50, LLC and represents their preferred project design;
2. Alternative 2 – Plant Site Alternative: This alternative was developed to reduce the amount of tree removal required and the potential visual effects from construction on the proposed power plant site;

3. Alternative 3 – Modified Pipeline Alternative: This alternative was developed to reduce potential impacts on visual, cultural and wildlife resources in the Basalt Canyon area; and
4. Alternative 4 – No Action Alternative. (DEIR, p. 2-3)

Alternatives rejected include:

- Underground Pipeline Alternative;
- Reduced Power Alternative;
- Alternative Plant Site in Basalt Canyon. (DEIR, pp. 2-81-83)

Of the 4 selected Alternatives, none consider alternative forms of energy development, for example distributed generation or solar energy development, and all four focus on versions of the existing proposed Project. Alternative 1 is the Project. Alternatives 2 and 3 consider slight alterations to Project configuration, but do not consider alternative sites or reduced power generation, which alternatives were rejected. And Alternative 4 is the no-Project scenario. These alternatives fail to provide the public or the reviewing agencies with sufficient information to evaluate whether substantial evidence supports the EIR's finding that the Alternative 3 satisfies the "preferred Alternative" requirement under NEPA, and the "environmentally superior alternative" requirement under CEQA. The Draft EIS/EIR should be revised to include a broader range alternatives that satisfy the renewable energy goals of the Project from alternative methods and sources. I14-64

The Draft EIS/EIR also failed entirely to evaluate any alternatives that would utilize existing geothermal resources within the Mono-Long KGRA. The MPLP Geothermal Complex consists of three other existing geothermal plants – the MP I Project, MP II Project, and PLES I Project. (DEIR, pp. 1-4-6) The MP I and MP II Projects are in close proximity to the proposed Casa Diablo Project, located just on the other side of Highway 395 from the Casa Diablo property, and are also owned by Ormat, the same parent company of the Applicant for the Casa Diablo Project. Therefore, the expansion of geothermal production at the existing plants, or sharing of some existing facilities in conjunction with the proposed Project, may be a feasible alternative to the Project. The Draft EIS/EIR fails to include any discussion of this, alternatives that would increase production at the existing Complex without adding the additional footprint of the Casa Diablo Project. This alternative should be evaluated in the Final EIS/EIR. I14-65

The EIS/EIR also rejects the Underground Pipeline Alternative, which would bury the two Project pipelines beneath the ground, thereby significantly reducing the potential barriers to wildlife movement and recreational trail use posed by the proposed Project's existing above-ground pipeline structure. I14-66

(DEIR, p. 2-91) The EIS/EIR rejects this alternative, stating that the construction and excavation required to install the underground pipelines and casing pipe would cause significant disturbance to the surrounding environment. (*Id.*) However, the EIS/EIR fails to include any discussion of the long-term benefits of the underground pipelines, and dismisses the alternative without any analysis of the reduced impacts to wildlife that the alternative would have.

I14-66 cont.

It is a widely accepted principle of wildlife biology that "habitat fragmentation...is a process that has been recognized as the greatest threat to species' persistence in the wild (Wilcox and Murphy 1985). Habitat fragmentation results in the reduction of a net larger habitat area than can be measured by summing the remaining, apparent habitat patches (Wilcox and Murphy 1985, Saunders et al. 1991, Hall et al. 1997)." (Exhibit B, Smallwood, at p. 3) Underground pipelines could eliminate this significant impact of the Project entirely, yet the EIS/EIR fails entirely to weigh the long-term benefits of this alternative against the presumed construction impacts. Additionally, the "casing pipe" proposed in this rejected alternative may provide additional protections against the accidental leakage of chemical motive fluids into the soil surface or injection wells, a problem that has already occurred in other pipelines in the MPLP Complex. This is not evaluated in the EIS/EIR.

I14-67

The Draft EIS/EIR must be revised to adequately consider a reasonable range of alternatives.

6. The Project Will Impermissibly Impact The Scenic Visual Resources of the Mammoth Lakes and Shady Rest Park Areas.

NEPA requires that an EIS analyze impacts of a Project that may significantly affect the quality of the "human environment." 42 U.S.C. § 4332. Courts have expressly held that this requirement contemplates that "aesthetic considerations are part of the human environment." *NAGE v. Rumsfeld*, 418 F. Supp. 1302, 1305 (E.D. Pa. 1976). CEQA also requires an analysis of the aesthetic impacts of a Project. Where aesthetic impacts of a Project are significant, mitigation and sometimes modifications to a Project may be required. *Pocket Protectors v. City of Sacramento* (2004) 124 Cal. App. 4th 903.

I14-68

Under FLPMA, it is the Department of the Interior ("DOI") to encourage the development of mineral resources, including geothermal resources, in federal lands. 43 U.S.C. §§ 1701(a)(7), (8), and (12). However, such development must be strictly managed so as not to degrade or diminish the value of public lands. In particular, FLPMA requires that BLM "develop, maintain, and, when appropriate, revise land use plans" for the public lands, 43 U.S.C. § 1712(a), and that the agency "[i]n managing the public lands . . . take any action necessary to prevent unnecessary or undue degradation of the lands." 43 U.S.C. § 1732(b).

Within the Project area, Geothermal Leases CACA-14407 and CACA-14408 were issued as part of Lease Block 2 in early 1985. These leases contain a special stipulation which states that "Except as otherwise approved by the BLM and the Forest Service, no surface disturbing activities related to geothermal energy development will be permitted on the land designated as No Surface Occupancy areas. In order for exploration or development activities to be approved on these lands, the lessee must show that the proposed activity or development can take place without significantly affecting USFS management objectives for the land in question. Such objectives include visual quality objectives, recreation objectives, and wildlife habitat and population objectives" (BLM, 1984). The CD-IV Project components affected by these stipulations include pipelines and wells in the vicinity of wells 12A-31, 23-31, 35-31, 81-36, 14-25 and 15-25 ("Restricted Surface Occupancy Area").

I14-68 cont.

The Project will have significant admitted visual impacts on surrounding recreational resources within the Inyo National Forest, including in particular Shady Rest Park, which will be completely surrounded by Project wells and in clear view of Project pipelines. (See DEIR, p. 2-21 (location of wells in proximity to Shady Rest Park), DEIR, p. 3.18-6 ("From Shady Rest Park, located at the end of Sawmill Cutoff Road (NFSR 03S08), recreationists have views of the western portion of the Project area including proposed well site 38-25."); DEIR, p.4.18-3, Figure 4.18-1). Shady Rest Park and its paved path are municipal facilities on Inyo National Forest lands managed under permit by the Town of Mammoth Lakes. Managed by the Town of Mammoth Lakes, Shady Rest Park includes playground equipment, a sheltered picnic area, restroom facilities, picnic tables, sand volleyball courts, softball fields, soccer fields, a concession stand, a small skate-park, and a parking area. (DEIR, p. 3.14-1)

A Project exceeds CEQA's significance threshold for visual impacts if it will "substantially degrade the existing visual character or quality of the site and its surroundings." (CEQA Guidelines, Appendix G; DEIR, p. 4.18-19) Here, the Project will have significant visual impacts on Shady Rest and other surrounding scenic areas that are likely to impair the purposes, use and enjoyment of the park. Mitigation Measures VIS-1 and VIS-3 fail to adequately mitigate these impacts, and the EIS/EIR rejected the underground pipeline Project alternative, which would arguably mitigate these visual impacts. The Draft EIS/EIR should be revised to impose mitigation measures and fully analyze Project alternatives related to underground piping and other measures to reduce the significant visual impacts on Inyo's valuable recreational resources.

I14-69

V. CONCLUSION

LiUNA Local Union No. 783 believes the Draft EIS/EIR is wholly inadequate and requires significant revision, recirculation and review. Moreover, LiUNA believes that the Project as proposed would result in too many unmitigated adverse impacts on the environment to be justified. California is in need of renewable energy. However, that energy cannot be obtained at the expense of other resources of the State. The Casa Diablo Project will result in significant impacts that have not been adequately considered, and presents an inadequate alternatives analysis, creating the potential for great harm to humans and the natural environment. All of these considerations weigh against approval of the Project as proposed, and necessitate revision to the Draft EIS/EIR to properly analyze all impacts of the Project.

I14-70

Thank you for your attention to these comments. Please include this letter and all attachments hereto in the record of proceedings for this project.

Sincerely,

Richard T. Drury
Christina M. Caro
Lozeau Drury LLP
Attorneys for Laborers' International Union of North America (LiUNA), Local Union No. 783

RECEIVED JAN 3 1 2013

EXHIBIT A

Heidi M. Rhymes, PG
625 2nd Street, Suite 210
Petaluma, CA 94952

January 25, 2013

Christina M. Caro, Assistant Attorney
Lozeau | Drury LLP
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Oakland, CA 94607

Subject: ***Casa Diablo IV Geothermal Energy Project Environmental Impact Report Geology and Water Resources Comments***

Dear Ms. Caro,

Thank you for the opportunity to comment on the Draft Joint Environmental Impact Statement and Environmental Impact Report Environmental Impact Report (EIR/EIS) for the Casa Diablo IV Geothermal Development Project (Project). The CD-IV Project includes the construction, operation, maintenance and decommission of a 33 net megawatt binary power plant and an expanded geothermal well field with an additional 16 geothermal resource wells, the construction of pipelines and an electric transmission line to interconnect to the Southern California Edison (SCE) Substation at Substation Road. Already existing in this area are three geothermal energy plants: MP I project (also called G-1) is a 10 MW plant and PLES 1 and MP 11 are both 15 MW plants for a total of 40 MW of existing net geothermal energy production in the Casa Diablo area. Please find my comments below on the Casa Diablo IV Geothermal Development Project.

EIR comments of Casa Diablo IV Proposed Geothermal Development Project
Heidi Rhymes, PG,
January 24, 2012

I) The EIR/EIS fails to thoroughly analyze impacts to local groundwater resources

According to Section 3.7.1.3 of the EIR/EIS, the Mammoth Groundwater Basin, drained by the upper reaches of the Mammoth Creek, supplies the Mammoth Lakes community with groundwater for potable purposes with a total average production of 1.3 cubic feet per second (CFS). The shallow groundwater system is separated from the underlying geothermal reservoir by either intense alteration of thick ash-rich Early Rhyolite units in the western caldera or low permeability rocks from a landslide which occurred in the south-central portion of the caldera from a catastrophic collapse approximately 760,000 years ago. The Mammoth Community Water District extracts groundwater from nine municipal wells, which are located primarily to the west and south of the project site. The groundwater depths in the wells range from 10 feet below ground surface (bgs) to 400 feet bgs.

The risk to the potable groundwater source from the proposed project lies in several areas. The first is that hazardous materials used in geothermal energy production are at risk of being released by accidents and man-made or natural disasters (i.e. earthquakes) into the shallow groundwater system. This can happen in multiple ways; either by an accidental release at the surface, by the contamination of injection fluids or by leaks within the extraction and injection system causing geothermal fluids and their associated chemicals to be released directly into the subsurface and underlying groundwater aquifer. The project area lies within and adjacent to the Hilton Creek fault – an Alquist Priolo Earthquake Fault Zone which defines known active faults, making the subsurface and groundwater vulnerable to accidental releases and contamination. Section 4.8.2 in the EIR/EIS indicates

I14-71

that mitigation GEO-6: "The CD-IV power plant and pipelines will be designed and constructed to reasonably minimize the potential for failure or rupture in the event of fault offset in these zones" is proposed to accommodate small to moderate level earthquakes but moderate to large earthquakes could result in serious groundwater impacts. It is proven that geothermal extraction systems do increase the occurrence of earthquakes in the vicinity of injection wells for geothermal systems (Majer and Peterson, 2008) and (Nicholson and Wesson, 1990). Sanyal (2005) stated that "Prolonged, high pressure injection may induce seismic activity at a geothermal site, particularly if the fluid pressure is increased beyond the original pore pressure and if there are subsurface zones of weakness or active faults near the injection area. While the occurrence of microearthquakes near injection sites have been documented in several geothermal fields, such as The Geysers in California, no major earthquakes due to injection in a geothermal field has yet been reported." However Sanyal (2005) continues to state that major earthquakes have been documented as being induced by the petroleum and waste injection industries. Although only smaller earthquakes have been noted thus far resulting from the existing geothermal plants in California, larger earthquakes have occurred in other geothermal areas and have been linked to the geothermal injection process (Majer and Peterson, 2008).

I14-71 cont.

Another risk of injection is that there exists a decent connection between the geothermal reservoir and the shallow groundwater system and that mixing may occur to some extent. Well P-17, located west of the project site, has already shown evidence of mixing according to section 4.7.4.1 of the EIR/EIS. The extraction and injection of geothermal fluids can deflate or inflate the reservoir and this can increase the risk of mixing. In addition, when geothermal reservoirs are depleted they can leave behind interstitial spaces

I14-72

elevated in heavy metals and elevated concentrations could impact the groundwater source if a pathway exists or is later formed. When groundwater comes in contact with geothermal fluids or former geothermal-extraction areas it is often removed as a beneficial use for human consumption and deemed non-potable. According to Section 3.19.2 of the EIR/EIS, such is the case with the groundwater located in the southeast portion of the project area where the lines of mixing are too close and the water is not suitable for consumption. The impacts to the overlying shallow groundwater systems show early signs of mixing and the impacts to the environment and natural resources with a 50% increase in production of geothermal fluids in this area has not adequately been addressed in the EIR/EIS for this project.

I14-72 cont.

Furthermore, as stated in section 4.7.4.1 of the EIR/EIS the models used are proprietary and as such the results and reports could not be vetted by the public. To date the EIR/EIS fails to include a thorough and public review of the subsurface hydrologic processes for the proposed project and fails to adequately analyze how the geothermal reservoir is connected to the overlying strata and groundwater systems that could be impacted by this project.

I14-73

II) The EIR/EIS fails to adequately address the impacts from the project to surface water quality

II.a) Impacts from the injection of hazardous substances into the subsurface

Surface water quality is critical to down river systems from the project area because these waters serve as important ecological and recreational resources. These resources are vulnerable to impacts from the existing and proposed project. For instance, according to Section 3.7.1.2 of the EIR/EIS in 1993 a leak of spent isobutene fuel in the existing Casa Diablo geothermal plant was accidentally released into the injection piping located above grade

I14-74

and the contaminated injection water was injected into the geothermal reservoir at approximately 1900 feet bgs. This chemical was subsequently detected up to 5 years later and 2 miles away at Hot Creek Gorge. Given the detection limits of isobutene and the distance the chemical travelled in the subsurface, in order to detect these chemicals up to 2 miles away and 5 years later the size of the leak had to have been more than a minor leak. The exact quantity accidentally injected was not indicated in the EIR/EIS. This accident demonstrated that a connection exists between the deeper reservoir and the shallow surface water systems and also indicates the continued and long-lasting impacts of mismanaged chemicals used in process operations at geothermal energy plants. As shown in Section 4.7.1 of the EIR/EIS the shallow geothermal system mixes with surface water in the area of Hot Creek and the presence of chemicals in these waters can have adverse impacts on the biological resources. Although the EIR/EIS addresses spill prevention problems it did not specifically detail how a future release of working fuel (isobutene or the equivalent) will be avoided in the future. The amount of geothermal energy being processed by the CD-IV project will increase production in this area 50% and therefore the risk and mitigations of a repeated release needs to be addressed.

I14-74 cont.

II.b) Impacts from storm water run off on surface water quality

The Basalt Canyon drainage originates north and west of the project area and traverses the project area towards Mammoth Creek. With the addition of numerous new well pads, roads, and equipment comes an increase in storm water run off and thus an increase in total dissolved solids along with an increased potential for contaminated run-off from added vehicle and equipment loading. Although the EIR/EIS in Section 4.8.2 proposes mitigation HYD-1: "Appropriate erosion control measures will be used to control any offsite discharges, and the Project will adopt any relevant LRWQCB and

I14-75

USFS best management practices to prevent soil erosion, including the preparation of a SWPPP" the EIR/EIS fails to adequately address the impacts of this added construction on Mammoth Creek. Mammoth Creek is already listed as an impaired water-body on Regional Water Quality Control Board's Clean Water Act Section 303(d) list for TDS and metals (RWQCB, 2013). The pattern of sheet flow in this area traverses the extensive project area directly and as such it should be thoroughly analyzed and the current EIR/EIS fails to do this. Furthermore, because existing facilities already increase run-off in the project area the combined impacts from the proposed and existing facilities needs to be taken into account and the EIR/EIS fails to accomplish this.

I14-75 cont.

II.c Increased risk to surface water quality from hazardous material releases

The surface waters are also at risk from a release of hazardous materials from chemicals used on the project site. As noted in Section 2.2.7.6 of the EIR/EIS there will be large amounts (9,000 – 12,000 gallons) of n-pentane used in the proposed CD-IV process as well as other hazardous chemicals such as fuel, lubricants, transformer oil and other chemicals. These chemicals, even if properly contained, can be mismanaged as demonstrated above or be released in to the environment in the event of a large earthquake. The EIR/EIS does not adequately study nor address the risk of these releases to the receiving water-bodies. The EIR/EIS does not discuss the risk to these water-bodies in event of a serious ground-shaking event, which could occur in this tectonically active area. Because of the sensitive nature of the down river habitats the study of the impacts of a release of these specific chemicals into the surface water-bodies should be included in the EIR/EIS.

I14-76

III) The EIR/EIS does not provide a thorough review of the risks to geothermal resources from the project

The proposed CD-IV project has the potential of impacting and irreversibly altering the natural geothermal features such as hot springs and pools, fumaroles (steam vents) and steaming ground in the vicinity of the project. As shown in Section 4.7.4.1 of the EIR/EIS water quality chemistry and temperatures indicate a clear connection from the Casa Diablo well field to the shallow geothermal features down flow from the site including Hot Creek Springs, Hot Bubbling Pool and Hot Creek Fish Hatchery. Reduction in temperatures of geothermal features can negatively impact the ecosystem and community resources. The rate of temperature decline (thermal drawdown) from the geothermal extraction/injection process in the reservoir exceeds the rate of recovery (Sutter, Fox et al., 2011) and although the process of geothermal energy is considered renewable reservoirs need "breaks" from extraction processes so that temperatures and pressures have time to recover to initial or close-to initial conditions. The decline in temperatures in a given system during the extraction and injection period will manifest themselves not only in the reservoir itself but also in the shallow geothermal features connected within the exploited reservoir. For this reason, as indicated in Section 4.7.4.1 of the EIR/EIS temperature declines are expected in the areas of concern for this project such as Hot Creek Springs, Hot Bubbling Pool, Hot Creek Fish Hatchery.

I14-77

As mentioned in Section 4.7.4.1 of the EIR/EIS the Applicant had a proprietary numerical model developed to simulate geothermal production and reservoir response, yet this model has not been reviewed by the public

and thus the data cannot be validated. In addition, the mass balance equations used in the Section 4.7.4.1 of the EIR/EIS using Monitoring Well MBP-3 and Monitoring Well 44-16 seem to include only one sampling event from each well. The data is typically more reliable when data sets include more than one data point for each hypothesis, which this does not. The EIR/EIS in Section 4.7.4.1 indicates that at the lower forecast temperature slightly lower inflow temperatures are expected at the major surface manifestations. Again, since the data is proprietary and not available to analyze this cannot be confirmed. The term "slightly lower" is not quantified. The EIR/EIS in Section 4.7.4.1 indicates that the thermal discharge at the Hot Creek Fish Hatchery is forecast to be reduced by 0.85% and that the thermal outflow to Hatchery Springs will be reduced by about 17%. Thus, this area appears sensitive to changes in thermal inflow from the Casa Diablo reservoir and this area and the ecosystem it supports relies on adequate thermal input to survive. The EIR/EIS does not seem to adequately study the impacts of these lowered temperatures on the surrounding resources and furthermore what studies were done are not available for public review. Due to the importance of these geothermal resources to the community and the ecosystems the EIR/EIS process should demand a thorough study of these impacts and the current one fails to supply this.

I14-77 cont.

IV) The EIR/EIS fails to adequately address the impacts from project-related subsidence

Subsidence is the sinking of the Earth's surface in response to geologic or human-induced causes. The scientific data as noted in Section 4.8.4 of the EIR/EIS shows that this area has undergone naturally occurring uplift in the resurgent dome and also subsidence. Subsidence was measured in this area,

I14-78

and although it is difficult to distinguish naturally occurring subsidence from those associated with geothermal extraction it is indicated in the EIR/EIS that subsidence does occur in isolated areas around the production wells. As noted in Section 4.8.4 on the EIR/EIS the USGS observed that the apparent amount of subsidence was limited and spatially related to the producing area around Casa Diablo. The subsidence totaled 310mm since 1997 however was balanced out by uplift from the resurgent dome. Although the configuration of wells for the CD-IV project are different than the existing project and reinjection of the cooling brine could help to reduce the degree of subsidence it should be expected that some degree of subsidence will be measured in the project area around the production wells. It is further noted that the rate of subsidence due from geothermal extraction will likely exceed the rate of uplift in the resurgent dome. This is because naturally occurring uplift typically takes thousands of years or more and the rate of subsidence from geothermal extraction is in the order of years and decades. Although the earthquake swarm in the caldera that occurred in the 1980's contributed to a rapid rate of uplift it is unlikely to repeat anytime soon and it is not expected that another uplift event will balance out any future subsidence from extraction during the length of this project. Subsidence in these areas can affect the integrity over time of the pipelines and other underground and aboveground facilities. Although the degree of subsidence is anticipated to be relatively minor, when combined with ground shaking events from the injection process, it could lead to compromised equipment which could lead to a release, either slow or catastrophic, of hazardous materials into the shallow groundwater system and/or surface waters. The EIR/EIS did not adequately address the risk to the public and the environment from impacts from subsidence when combined with ground shaking events that could occur from this project.

I14-78 cont.

V) The EIR/EIS fails to thoroughly review the risks of induced seismicity from the project

It has been shown that the injection of fluids into an area that is tectonically active and that has active faults proximal to the injection area can increase the amount of earthquakes in that vicinity (Majer and Peterson, 2008). Section 4.8.4.1 of the EIR/EIS states that "Although earthquakes typically occur naturally, seismicity has at times been induced by human activity, including the development of geothermal fields, through both production and injection operations (Geothermal Energy Association, 2007). In these cases, the resulting seismicity has been low-magnitude events known as microearthquakes." Thus far, as indicated in Section of the EIR/EIS 4.8.4.1 it has only been smaller earthquakes which have been correlated with geothermal injection wells, however, it has been shown in previous studies by Nicholson and Wesson (1990) that when the volume of injection fluids into an area increases so too does that quantity and strength of the earthquakes. Components, including the proposed power plant, substation, several wells and transmission lines, lie within the Hilton Creek fault zone. In 1980 several M+6 earthquakes occurred along this fault. As mentioned above, although previous geothermal injection activities in the existing geothermal plants in California have been linked to earthquakes they have not yet been large enough cause damage. However, as stated above as injection levels increase so does the frequency and magnitude of the earthquakes. The probabilistic seismic hazard assessment (PHSA) indicates that at the CD-IV project site there is a 10% chance of exceeding peak ground acceleration (PGA) values of 0.40g-0.50g over the next 50 years, depending on site specific ground conditions. According to the Modified Mercalli Intensity Scale an earthquake

I14-79

within this range is a very strong earthquake with slight damage to newer reinforced buildings, considerable damage in ordinary substantial buildings, great damage in poorly built structures, heavy furniture overturned, the fall of chimneys, factory stacks, columns and monuments. The EIR/EIS does not adequately address the increased seismic risk from the proposed injection activities combined with the already existing injection activities. A full-scale open review is needed of the impacts of the combined injections onto the existing risk of fault rupture in this area. The current EIR/EIS fails to address these issues.

I14-79 cont.

CONCLUSION

In conclusion, the EIR/EIS for the Casa Diablo IV Geothermal Development Project does not put forth and fair and full review of areas discussed above pertaining to geology, soil and water resources for this project. The EIR/EIS should include additional review and information on the referenced items above prior to approval so that the risks to the environment and to the community can be thoroughly understood and evaluated by the public and the decision-makers.

I14-80

Very Truly Yours,

Heidi M Rhymes

Heidi Rhymes, PG

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Collin Reinhardt, Project Manager
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14 January 2013

RE: Casa Diablo IV Geothermal Development Project

Dear Mr. Reinhardt,

I would like to comment on the DEIR/DEIS prepared for the 33-MW Casa Diablo IV Geothermal Development Project (ESA 2012). My qualifications for preparing expert comments are the following. I earned a Ph.D. degree in Ecology from the University of California at Davis in 1990, where I subsequently worked for four years as a post-graduate researcher in the Department of Agronomy and Range Sciences. My research has been on animal density and distribution, habitat selection, habitat restoration, interactions between wildlife and human infrastructure and activities, conservation of rare and endangered species, and on the ecology of invading species. I have authored numerous papers on special-status species issues, including "Using the best scientific data for endangered species conservation," published in Environmental Management (Smallwood et al. 1999), and "Suggested standards for science applied to conservation issues" published in the Transactions of the Western Section of The Wildlife Society (Smallwood et al. 2001). I served as Chair of the Conservation Affairs Committee for The Wildlife Society – Western Section. I am a member of The Wildlife Society and the Raptor Research Foundation, and I've been a part-time lecturer at California State University, Sacramento. I was also Associate Editor of wildlife biology's premier scientific journal, The Journal of Wildlife Management, as well as of Biological Conservation, and I was on the Editorial Board of Environmental Management.

I have performed wildlife surveys in California for twenty-three years (Smallwood et al. 1996, Smallwood and Nakamoto 2009). Over these years, I studied the impacts of human activities and human infrastructure on birds and other animals, including on California mountain lions (Smallwood 1997), Swainson's hawks (Smallwood 1995), burrowing owls (Smallwood et al. 2007), and other species (Smallwood and Nakamoto 2009). I studied fossorial animals (i.e., animals that burrow into soil, where they live much of their lives), including pocket gophers, ground squirrels, kangaroo rats, voles, harvester ants, and many other functionally similar groups. I performed focused studies of how wildlife interact with agricultural fields and associated cultural practices, especially with alfalfa production. I have also performed wildlife surveys at many proposed project sites, including in the immediate area of the proposed project. My CV is attached.

I. INSUFFICIENCY OF DEIR/DEIS

A. The EIR/EIS Fails to Provide Adequate or Accurate Information on Special-Status Wildlife Species that may be Adversely Affected by the Project

Whereas I concur with the DEIR/DEIS's conclusion that northern goshawk is highly likely to occur on site (page 3.4-7), I disagree with most of the conclusions of occurrence potential of other special status species. For example, the bald eagle was given low potential to occur, because the DEIR/DEIS claimed that the project site does not offer foraging habitat. However, bald eagles forage in Crowley Lake, only 12 km away, and they likely forage in smaller water bodies within only 2-3 km from the project site. Bald eagles often roost in conifers nearby but not immediately adjacent to foraging areas, so it is not unreasonable to consider the project site as potentially useful to bald eagles. I14-81

I strongly disagree with the DEIR/DEIS that golden eagles are unlikely to occur at the project site (page 3.4-7). I have seen golden eagles foraging in areas similar to the conditions at the project site. I have witnessed golden eagle's hunting in conifer forests by beating their wings against tree branches while descending slopes, apparently as an attempt to flush potential prey items. There is nothing about the project site that would limit golden eagle occurrence. I14-82

The DEIR/DEIS attributed moderate potential for the occurrence of greater sage grouse, but I have been in greater sage grouse habitat many times, including at the project site. I do not see any reason why high occurrence potential should be attributed to greater sage grouse at the proposed project site. I14-83

Prairie falcons were concluded to have low potential due to lack of habitat at the project site. I have observed prairie falcons many times during my surveys, including in partially forested environments. The project site is a mix of forest and sage scrub, so a conclusion of low potential was not warranted. Prairie falcons have a moderate to high potential for occurrence at the project site. I14-84

In the absence of appropriate surveys, the DEIR/DEIS concluded that the occurrence potential was only moderate for two species of bats: Pallid bat and Townsend's big-eared bat. The DEIR/DEIS concluded that the occurrence potential was low for five species of bat: Silver-haired bat, Western red, Long-eared myotis, Long-legged myotis, and Yuma myotis. Little is known about the habitat use of these bats, because few studies have been performed. In the absence of appropriate surveys and scientific studies, the DEIR/DEIS was unjustified in concluding low or moderate occurrence potentials of these species. The prudent conclusion, and one that would be more consistent with the environmental protection objectives of CEQA, would be that all of these bat species likely use the project site. I14-85

The DEIR/DEIS concluded only a moderate potential for Sierra Nevada red fox to occur at the project site, but there is nothing about the site that would discourage Sierra Nevada red fox from occurring there. During my statewide surveys for mountain lions, I recorded fox tracks on one of my transects, which happens to have been immediately adjacent to the project site. I have surveyed that transect seven times since 1985. In 1992, I recorded fox tracks, although I cannot I14-86

be certain that these tracks were left by Sierra Nevada red fox (instead of gray fox). There is no reason why Sierra Nevada red fox would not occur at the project site, and my discovery of fox tracks in the area serves as potential evidence of their occurrence. I14-86 cont.

The DEIR/DEIS made no mention of American badger (*Taxidea taxus*), which is a California Species of Special Concern[1] (CSC). Nor did the DEIR/DEIS mention California mountain lion, which is a Specially Protected Species under state law. During my mountain lion surveys since 1985, I have detected tracks of both American badger and California mountain lion on my survey transect, only a mile or two from the proposed project site. I14-87

The proposed project site supports multiple special-status species of wildlife, some of which the DEIR/DEIS acknowledged, and some of which it dismissed without sound scientific reasoning. The DEIR/DEIS concluded that the following special-status species of wildlife have the potential to occur on the project site: northern goshawk, greater sage-grouse, pallid bat, Townsend's big-eared bat, western white-tailed jackrabbit, Sierra Nevada red fox, and Sierra marten. To this list, I add American badger, California mountain lion, Silver-haired bat, Western red, Long-eared myotis, Long-legged myotis, and Yuma myotis, golden eagle, bald eagle, and prairie falcon. The project's impacts would be significant to at least 17 special-status species. I14-88

B. Movement corridors and habitat fragmentation

The DEIR/DEIS did not discuss the project's contribution to habitat fragmentation, which is a process that has been recognized as the greatest threat to species' persistence in the wild (Wilcox and Murphy 1985). Habitat fragmentation results in the reduction of a net larger habitat area than can be measured by summing the remaining, apparent habitat patches (Wilcox and Murphy 1985, Saunders et al. 1991, Hall et al. 1997). The project, as proposed, would impose a sprawling barrier to wildlife movement due to the 6.5 acre power plant, an expanded well field totaling 45 acres, above-ground pipelines, 650 feet of new transmission totaling 0.75 acres of additional forest clearing, a new substation on 0.25 acres, 0.77 miles of new roadway, and 5.58 miles of road improvements. Furthermore, this sprawling addition of wildlife movement barriers is proposed to be oriented generally east-west across most of the low-lying portion of a natural movement corridor between the City of Mammoth Lakes and higher-elevation terrain to the east. The possible direct and cumulative impacts of this project as a movement barrier was not discussed in the DEIR/DEIS, leaving it inadequate as a CEQA review document. I14-89

II. CUMULATIVE IMPACTS

What remains of a naturally-occurring, north-south, wildlife movement corridor will be impeded by the proposed project. The DEIR/DEIS should have mapped the locations and extent of existing human infrastructure, as well as proposed and likely future clearing of habitat and imposition of additional human infrastructure. A map of existing and conceivable future projects would most effectively inform the readers of the DEIS/DEIR of the likely cumulative effects of the project on wildlife movement through the area. I14-90

[1] The California Department of Fish and Game continues to not list this species as CSC on its web site, but I have a copy of a letter from CDFG explaining that the listing omission was a mistake and that the American badger is indeed considered to be CSC.

III. MITIGATION

Project design Measure 1: The DEIR/DEIS states that a wildlife biologist will walk the length of the new pipeline to look for signs of impedance of wildlife movement caused by the pipeline. However, the DEIR/DEIS needed to clarify how the monitor would determine whether the pipeline is impeding wildlife movement. More details are also needed, including the time of year the biologist would survey the pipeline, and what steps could be taken to reduce the impact, should an impact be detected. I14-91

Project design Measure 2: Thresholds of success need to be established, and monitoring to measure effectiveness needs to be designed and implemented. A performance bond should be established, and it should be linked to the thresholds of success. I14-92

Project design measures 3 through 7: The DEIR/DEIS was vague about who will be responsible for implementing the proposed measures. Who will be responsible for monitoring their implementation and effectiveness? I14-93

WIL-2: Impacts could be minimized by removing accumulated water daily from lined well site basins, or by installing ramps. However, the DEIR/DEIS needs to include consequences for not taking these steps, and there needs to be mitigation monitoring to ensure that this measure is implemented. Again, a performance bond should be required, along with thresholds linked to these measures and consequences for not meeting the thresholds. I14-94

WIL-3: Whereas this measure would minimize impacts by retaining downed woody debris and snags to the degree feasible, it does nothing to offset project impacts. I14-95

WIL-4: Whereas it would be best to work with CDFG in designing and siting a new deer crossing, the DEIR/DEIS needs to identify an alternative plan in case the best-intended plan for a new deer crossing fails. Mule deer might not cooperate with the applicant's plan for a new deer crossing, or the crossing might be infeasible for reason(s) biologists do not understand. Again, a performance bond is needed for the project's impacts on mule deer movement patterns in the area, and monitoring linked to performance thresholds is needed. It needs to be explained what can and will be done should the new deer crossing fail. I14-96

WIL-5: Again, this measure looks reasonable as a logic exercise, but best laid plans do not always work out. A performance bond is needed, along with monitoring linked to thresholds of success, and along with alternative measures. I14-97

WIL-6: The DEIR/DEIS needs to be more explicit about what qualifies as a deer crossing or as a movement corridor. Is there a quantitative threshold of activity that can be added to the DEIR/DEIS? Leaving the definitions vague usually results in no action, in my experience. I14-98

WIL-7: Both pre- and post-construction surveys are needed for greater sage grouse, as well as for other special status species. These surveys are needed to detect project impacts, so that additional impact reduction measures can be taken, as well as compensatory mitigation. I14-99

The DEIR/DEIS proposed no compensatory mitigation of any kind. The project will reduce wildlife habitat, which should be mitigated. The project will also interfere with wildlife movement patterns, and this impact should also be mitigated through some form of compensation. I14-100

IV. MITIGATION MONITORING

It has long been known that mitigation pursuant to CEQA has often either failed or has not been implemented, but with no consequences to the take-permit holder (Silva 1990). There should be consequences for not achieving mitigation objectives or performance standards. The project proponents should be required to provide a performance bond in an amount that is sufficient for an independent party to achieve the mitigation objectives originally promised, and in this case, the promises should be much more substantial. A fund is needed to support named individuals or an organization to track the implementation of mitigation measures. Report deadlines should be listed, and who will be the recipients of the reports. In my professional opinion, the lack of specific mitigation monitoring details in the EIR/EIS renders it inadequate and uncertain, and makes it impossible to gauge whether or to what extent any mitigation measures will lessen potentially significant impacts on species, If these measures are not clearly laid out in the EIR/EIS, then there will be no basis to determine that impacts will be less than significant once implemented, and fail to provide enforceable performance measures by which the public and regulatory agencies can gauge their effectiveness. Furthermore, without adequate funding allocated in advance, there is no certainty that any proposed mitigation monitoring will actually take place. I14-101



Shawn Smallwood, Ph.D.

V. REFERENCES

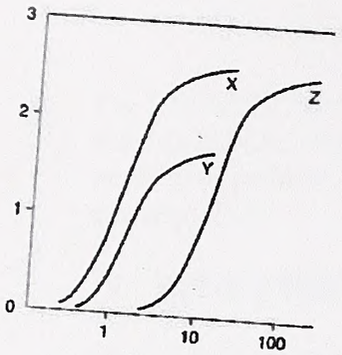
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RECEIVED JAN 3 1 2013

EXHIBIT C



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January 30, 2013

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Attn: Ms. Christina Caro

Subject: Comment Letter on Draft Environmental Impact Report for Casa Diablo IV Geothermal Development Project

Dear Ms. Caro,

At the request of Lozeau | Drury LLP (Lozeau Drury), Clark and Associates (Clark) has reviewed materials related to the above referenced project, including the Public Draft Joint Environmental Impact Statement (DEIS) and Environmental Impact Report (DEIR)[1] prepared for the Bureau of Land Management (BLM), the United States Forest Service (USFS), Inyo National Forest, and the Great Basin Unified Air Pollution Control District (GBUAPCD). The proponent, ORNI 50 LLC, a wholly-owned subsidiary of Ormat Nevada, Inc, is proposing to construct, operate, maintain and decommission a 33 megawatt (MW) geothermal power generating facility and related infrastructure near Mammoth Lakes in Mono County, California. According to the DEIS/DEIS, the Applicant's initial application was filed on February 17, 2010 by Mammoth Pacific, L.P. (MPLP). Since then, MPLP was acquired by Ormat Nevada Inc., which formed a wholly owned subsidiary (ORNI 50, LLC) for the CD-IV Project. ORNI 50, LLC submitted a revised application to BLM in June 2012.

[1] BLM. 2012. Casa Diablo IV Geothermal Development Project Public Draft Joint Environmental Impact Statement and Environmental Impact Report. State Clearinghouse No. 2011041008.

Clark's review of the materials in no way constitutes a validation of the conclusions or materials contained within the plan. If we do not comment on a specific item this does not constitute acceptance of the item.

Project Description

The majority of the CD-IV Project would be developed on National Forest System Lands where the surface resources are managed by the United States Forest Service (USFS), Inyo National Forest and the mineral resources are managed by the Bureau of Land Management (BLM), Bishop Field Office.

According to the DEIS/DEIR, the CD-IV Project would be located in the vicinity of the existing Mammoth Pacific L.P. (MPLP) geothermal complex located within the Mono-Long Valley Known Geothermal Resource Area (KGRA) near the town of Mammoth Lakes in Mono County, California. The DEIS/DEIR also describes the proposed location of the CD-IV Project as residing within the MPLP Geothermal Complex (Figure 1-1, Existing Facilities). The CD-IV Project would be the fourth geothermal power plant in the complex.[2]

The CD-IV Project would construct a new 33 net MW binary power plant, develop an expanded geothermal well field of up to 16 geothermal resource wells, construct pipelines to bring the geothermal brine to the power plant and pipelines to take the cooled brine to injection wells, and install an electric transmission line to interconnect to the Southern California Edison (SCE) Substation at Substation Road.

The CD-IV Project facility is described as:

1. A geothermal power plant consisting of two (2) Ormat Energy Converter (OEC) binary generating units (21.2 MW gross each) with vaporizers, turbines, generators, air-cooled condensers, preheaters, pumps and piping, and related ancillary

[2] BLM. 2012. Casa Diablo IV Geothermal Development Project Public Draft Joint Environmental Impact Statement and Environmental Impact Report. State Clearinghouse No. 2011041008. Page 1-4

equipment. The gross power generation of the CD-IV plant would be 42.4 MW. The estimated auxiliary and parasitic loads (power used within the project for circulation pumps, fans, well pumps, loss in transformers and cables) is about 9.4 MW, thus providing a net power output of about 33 MW. Additional components of the power plant would include:

a) A motive fluid system consisting of motive fluid (n-pentane) storage vessels (either one or two vessels in the range of 9,000 to 12,000 gallons) and motive fluid vapor recovery systems (VRUs). Each VRU would consist of a diaphragm pump and a vacuum pump.

b) A new substation would be constructed on the power plant site and would be connected to the SCE Casa Diablo Substation at Substation Road.

c) An overhead 33 kV transmission line connecting the power plant substation with the SCE Casa Diablo Substation approximately 650 feet (198 meters) long.

2. Up to 16 geothermal wells are proposed. Fourteen of the wells would be located in the Basalt Canyon Area and two wells would be located southeast of the proposed power plant east of U.S. Highway 395. The specific locations for these wells would be selected out of the 18 possible locations shown in Figure 2-2 of the DEIS/DEIR. The actual number may be less depending on the productivity of the wells. The final number and location of wells would be determined by modeling and actual drilling results. Approximately half of the wells would be production wells and the other half would be injection wells. Each production well would range in depth from 1,600 to 2,000 feet below ground surface (bgs), and each new injection well would be drilled to approximately 2,500 feet bgs. Production wells would be equipped with a down-hole pump powered by a

surface electric motor. Most of the well sites in Basalt Canyon have been analyzed previously for the development of exploratory wells, two of which were drilled in 2011. Additional detail is provided in Section 2.2.4.

3. Piping would extend from production wells to the power plant and from the power plant to the individual injection wells. Two main pipelines would parallel the existing Basalt Canyon pipeline and would cross beneath U.S. Highway 395 between the wellfield and the CD-IV power plant site. Where pipelines must cross another pipeline or a road, the crossings would be underground.
4. Power and control cables for the wells would be installed in above-ground cable trays placed on the pipeline supports. Appurtenant facilities include pumps, tanks, valves, controls, and flow monitoring equipment.

This DEIS/DEIR was issued prematurely without considering the serious flaws in the Proponent's analysis of the project, and these flaws are replicated in the DEIS/DEIR. The flaws include:

1. failure to provide a clear description of the project;
2. fails to adequately screen the project impacts when they fail to adequate describe the project and the project components;
3. failure to perform an adequate air quality analysis;
4. failure to adequately estimate the air quality burden the project will place on the air basin; and
5. failure to perform an odor analysis.

I14-102

The DEIS/DEIR also fails to identify and adequately mitigate significant adverse impacts on air quality from Project construction. Finally, the proponent has a long track record of unauthorized releases above permit threshold levels. There is no evidence that conditions at the new facility will be maintained in a better manner.

I. Failure To Provide Clear Description Of Project

The proponent fails to adequately describe the size and scope of the project, which must be viewed as a component of a larger existing facility. The MPLP Geothermal Complex currently includes 3 existing generating stations: the 14 MW Mammoth Pacific I unit (MP-1), the 15 MW Mammoth Pacific II unit (MP-II), and the 15 MW PLES-I unit (PLES-I) totaling 44 MW in net generating capacity at the site.

I14-103

The proponent of the project has also proposed to replace the MP-1 facility with a new structure. Since the MP-1 project has been approved by the County, the Applicant will increase the total gross generating capacity of the Casa Diablo Geothermal Complex from 44 MW to up to 96 MW with the addition of the CD-IV Project. Therefore, the actual potential Project involves the addition of 52 MW of generation to the existing complex. The parsing of the project into different DEIS/DEIR fails to meet CEQA's requirements for a complete description of the project. The proponent must analyze the impact the CD-IV Project will have on the whole MPLP Geothermal Complex, rather than parsing the project piecemeal in separate DEIRs.

II. The DEIS/DEIR Fails To Adequately Screen The Project Impacts When They Fail To Adequate Describe The Project And The Project Components.

I14-104

The CEQA Guidelines, Appendix G, establish that impacts on air quality would be "significant" if a project would violate any ambient air

quality standard or substantially contribute to an existing or projected violation of an ambient air quality standard. To determine whether such violations occur, it is common practice for lead agencies to compare ***project*** emissions to quantitative significance thresholds developed by local air districts as a screening tool for CEQA review.

Thresholds of significance for construction emissions are typically expressed on a short-term basis, *i.e.* daily or hourly basis to adequately capture impacts due to the high variability of emissions during different construction stages. The Project site is under the jurisdiction of the GVAPCD, which has not developed significance thresholds for construction like most other air districts. Given the lack of quantitative significance thresholds in the GVAPCD's guidance, the Proponent could have conducted ambient air quality dispersion modeling to evaluate whether ambient air quality standards would be violated during any of the construction phases.

I14-104 cont.

The CD-IV Project is located in the Great Basin Valleys Air Basin (GBVAB), which includes Mono, Inyo, and Alpine Counties. Mono County is designated non-attainment for the federal and state standards for ozone and PM_{10}. Mono County is also has the highest population density of all the counties in the GBVAB, with the Town of Mammoth Lakes having the greatest population in the county. In the absence of quantitative significance thresholds from GVAPCD, the Proponent has used short-term significance thresholds developed by another air district, the Imperial County Air Pollution Control District (ICAPCD) to screen for significance of criteria pollutant emissions.

The Proponent notes that the Imperial County is a rural county similar to Mono County with existing and proposed geothermal development projects. The Imperial County Air Basin is also a federal and state non-attainment area for both ozone and particulate matter less

than 10 microns (PM_{10}).[3] The majority of air basins in California are a federal and state non-attainment area for both ozone and PM_{10}, including the basins immediately adjacent to GBVAB (the Mountain Counties, San Joaquin Valley, and Mojave Desert). What the proponent does not note is that ICAPCD has some of the highest published significance thresholds for particulate matter less than 10 microns (PM10) in the State of California.

Table 1:
CEQA significance thresholds for construction emissions from various air districts

Air district construction thresholds*	NOx (lbs/day)	ROG (lbs/day)	PM_{10} (lbs/day)	DPM (lbs/day)	$PM_{2.5}$ (lbs/day)	CO (lbs/day)
ICAPCD	55	55	150			550
BAAQMD	54	54	82		54	
SCAQMD	100	75	150		55	550
EDCAPCD	82	82				
SLOCAPCD				7		
MBUAPCD			82			550
FRAQMD	25	25	80			
SMAQMD	85					
YSAQMD	82	82	150			

ICAPCD = Imperial County Air Pollution Control District, CEQA Handbook, 2007;
SCAQMD = South Coast Air Quality Management District, CEQA Handbook, 1993;
BAAQMD = Bay Area Air Quality Management District, CEQA Guidelines 2009;
EDCAPCD = El Dorado County Air Pollution Control District, CEQA Guide, February 2002;
SLOCAPCD = San Louis Obispo County Air Pollution Control District, CEQA Air Quality Handbook, December 2009.
MBUAPCD = Monterey Bay Unified Air Pollution Control District, CEQA Air Quality Guidelines, June 2004,
FRAQMD = Feather River Air Quality Management District, http://www.fraqmd.org/CEQA_Thresholds.htm;
SMAQMD Sacramento Metropolitan Air Quality Management District, Guide to Air Quality Assessment, July 2004;
YSAQMD, Yolo-Solano Air Quality Management District, Air Quality Handbook, Guidelines for Determining Air Quality Thresholds of Significance and Mitigation Measures for Proposed Development Projects that Generate Emissions from Motor Vehicles, revised 2002

I14-104 cont.

Given the proximity of the major population center for Mono County (the Town of Mammoth Lakes) to the proposed project and the existing air quality burden that exists in the County, it would be prudent to use a lower significance threshold than the one proposed by the Proponent.

[3] BLM. 2012. Casa Diablo IV Geothermal Development Project Public Draft Joint Environmental Impact Statement and Environmental Impact Report. State Clearinghouse No. 2011041008. Pg 4.2.-6

Proponents should re-evaluate the potential impacts using a more conservative/health protective significance threshold in a Supplemental EIR (SEIR). I14-104 cont.

III. Failure To Perform An Adequate Air Quality Analysis

The DEIS/DEIR's air quality analysis is deficient and must be updated in a SEIR. The analysis fails to: (1) adequately characterize the potential impacts from construction activities; and, (2) analyze potential health risks from HAPs during the operational phase of the project. Therefore, a revised EIR should be prepared to include a thorough evaluation of all air quality issues associated with the project. I14-105

(1) The DEIS/DEIR fails to accurately estimate the potential emissions from construction activities for the Project. Proponents rely on emissions factors that are assumed to include typical control measures presumptively, producing lower than emissions than previously assumed.

A. The Emission Factors Used To Calculate PM_{10} Emissions Are 71% Lower Than Factors Published By USEPA

Using the U.S. EPA's AP-42[4] emission factor for construction related emissions of total suspended particulate of 1.2 tons per acre per month of activity. The California Air Resource Board (CARB) estimates that 64% of construction-related total suspended particulate emissions is PM_{10}. This yields the following **emission factors for uncontrolled construction-related PM_{10} emissions:** I14-106

- 0.77 tons per acre per month of PM_{10}, or
- 51 lbs. per acre per day of PM_{10}.

The emission factors utilized in the construction analysis performed by the Proponent were compiled by the Midwest Research Institute (MRI)

[4] U.S. EPA. 1995. Compilation of Air Pollutant Emission Factors, Volume I: Stationary, Point and Area Sources, AP-42, 5th Edition, January 1995 for further information

under contract to the PM_{10} Best Available Control Measure (BACM) Working Group. According to CARB, the bulk of the operations observed by MRI were site preparation-related activities.[5] The site estimates were combined with operation-specific emission factors from USEPA's AP-42 to produce an overall "average" emission factor of 0.11 tons PM_{10}/acre-month. CARB notes this was 71% lower than AP-42's 4th edition value.[6] As a daily emission factor, the MRI's average emission factor (0.11 tons PM_{10}/acre-month) is equivalent to 10 lbs PM_{10}/acre-day. I14-106 cont.

What proponents do not indicate in their analysis is that the MRI's value assumes the effects of typical control measures such as routine watering. A dust control of 50% is assumed for these measures. The MRI value therefore underestimates the potential emissions from construction activities.

B. The Emission Factors Used To Calculate PM_{10} Emissions Should Have Included A Worst Case Scenario Emission Factor Value Which Is Approximately 4 Times Higher

According to the CARB,[7] the MRI report also included an emission factor for worst-case emissions of 0.42 tons PM_{10}/acre month emission factor, the MRI's worst-case emission factor (0.42 tons PM_{10}/acre-month) is equivalent to 38.18 lbs PM_{10}/acre-day. I14-107

CARB notes that the worst-case emission factor is appropriate for large-scale construction operations, which involve substantial earthmoving operations.[8] The worst case scenario value has been utilized by SCAQMD to sites that involve substantial earthmoving operations.[9]

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[5] CARB. 2002. Emission Inventory Source, Building Construction Dust. pg 7.7-2 http://www.arb.ca.gov/ei/areasrc/fullpdf/full7-7.pdf
[6] CARB. 2002. Emission Inventory Source, Building Construction Dust. pg 7.7-2 http://www.arb.ca.gov/ei/areasrc/fullpdf/full7-7.pdf
[7] CARB. 2002. Emission Inventory Source, Building Construction Dust. pg 7.7-2 http://www.arb.ca.gov/ei/areasrc/fullpdf/full7-7.pdf
[8] CARB. 2002. Emission Inventory Source, Building Construction Dust. pg 7.7-2 http://www.arb.ca.gov/ei/areasrc/fullpdf/full7-7.pdf
[9] CARB. 2002. Emission Inventory Source, Building Construction Dust. pg 7.7-2 http://www.arb.ca.gov/ei/areasrc/fullpdf/full7-7.pdf

Table 4.2-3 of the DEIS/DEIR, shows the maximum day emissions (in pounds per day) for the project as 98 lbs per day. This assumes all three phases of construction (power plant construction, well construction, and pipeline construction) occur simultaneously. Appendix C -1 of the DEIS/DEIR, indicates in Section 5 (page C-9) that 49.8 lbs of the emissions come from fugitive dust from trucks on unsaved roads. The remaining 35 lbs of PM_{10} comes from construction activities.

I14-107 cont.

Using the more conservative worst-case emission factor for PM_{10} emissions from construction, the 35 lbs of fugitive dust from construction activities increases to 133.63 lbs per day. The cumulative fugitive (fugitive dust from construction and traffic) is therefore as high as 183.43 lbs per day. This value exceeds all of the regulatory thresholds of significance shown in Table 1. The proponent must re-evaluate using the worst-case emission factor or use USEPA's factor.

(2) The proponents have failed to analyze potential health risks from hazardous air pollutants (HAPs) during the operational phase of the project. Proponents state that health risks are assessed qualitatively and full health risk assessment was not warranted.[10] Although they acknowledge the potential of releases of hydrogen sulfide or H_2S from drilling activities and diesel exhaust from construction equipment, Proponents fail to acknowledge that there are health consequences from short-term exposures to these chemicals and that they may be transported long distances.

I14-108

Hydrogen sulfide, H_2S, is a known respiratory irritant and hazardous air pollutant (HAP). Diesel exhaust contains nearly 40 toxic substances including toxic air contaminants (TACs) and may pose a serious public health risk for residents in the vicinity of the facility. TACs are airborne substances that are capable of causing short-term (acute) and/or long-term

[10] BLM. 2012. Casa Diablo IV Geothermal Development Project Public Draft Joint Environmental Impact Statement and Environmental Impact Report. State Clearinghouse No. 2011041008. Pg 4.2.-4

(chronic or carcinogenic, i.e., cancer causing) adverse human health effects (i.e., injury or illness). TACs include both organic and inorganic chemical substances. The current California list of TACs includes approximately 200 compounds, including particulate emissions from diesel-fueled engines.

Evidence exists that clouds of soot emitted by heavy-duty construction equipment can travel downwind for miles, then drift into heavily populated areas. For example, health impact studies from the South Coast Air Quality Management District[11] (SCAQMD) have documented that diesel emissions travel miles from the sources impacting residents.

I14-108 cont.

Diesel exhaust has been linked to a range of serious health problems including an increase in respiratory disease, lung damage, cancer, and premature death[12,13,14]. Fine diesel particles are deposited deep in the lungs in the smallest airways and can result in increased respiratory symptoms and disease; decreased lung function, particularly in children and individuals with asthma; alterations in lung tissue and respiratory tract defense mechanisms; and premature death.[15] Exposure to diesel exhaust increases the risk of lung cancer. It also causes non-cancer effects including chronic bronchitis, inflammation of lung tissue, thickening of the alveolar walls, immunological allergic reactions, and airway constriction.[16]

[11] SCAQMD MATES I, II, and III have documented the impacts for DPM in the SCAB.
[12] California Air Resources Board, Initial Statement of Reasons for Rulemaking, Proposed Identification of Diesel Exhaust as a Toxic Air Contaminant, Staff Report, June 1998.
[13] U.S. EPA, Health Assessment Document for Diesel Engine Exhaust, Report EPA/600/8-90/057F, May 2002.
[14] Environmental Defense Fund, Cleaner Diesel Handbook, Bring Cleaner Fuel and Diesel Retrofits into Your Neighborhood, April 2005; http://www.edf.org/documents/4941_cleanerdieselhandbook.pdf, accessed March 27, 2008.
[15] California Air Resources Board , Initial Statement of Reasons for Rulemaking, Proposed Identification of Diesel Exhaust as a Toxic Air Contaminant, Staff Report, June 1998.
[16] Findings of the Scientific Review Panel on The Report on Diesel Exhaust as adopted at the Panel's April 22, 1998 Meeting.

A recent analysis found that air pollution from diesel construction equipment is already taking a heavy toll on the health and economic well-being of Californians.[17,18]

In addition to potential releases of H_2S, the project could produce large quantities of ammonia. [19] Ammonia released to the environment has the potential during normal operation to create significant secondary particulate impacts. Ammonia emitted by the Project can react with sulfite (SO_3) and nitrogen dioxide (NO_2) downwind in the atmosphere to form ammonium sulfate, ammonium bisulfate, and ammonium nitrate according to the following reactions. (Seinfeld and Pandis 1998, pp. 529-534;[20] Matsuda *et al.* 1982;[21] Burke and Johnson 1982.[22])

I14-108 cont.

$$SO_3 + 2\ NH_3 \rightarrow (NH_4)_2SO_4 \quad (1)$$
$$SO_3 + NH_3 \rightarrow NH_4HSO_4 \quad (2)$$
$$NO_2 + OH + NH_3 \rightarrow NH_4NO_3 \quad (3)$$

The increase in PM in the region will only exacerbate the already serious air quality issues in the region.

IV. Failure To Adequately Estimate The Air Quality Burden The Project Will Place On The Air Basin

I14-109

The DEIS/DEIR fails to adequately characterize the operational

[17] These estimates are conservative because they do not include emissions from a large number of small construction projects (residential and commercial and projects smaller than 1 acre in size). Further, John Hakel, vice president of the Associated General Contractors, which represents construction equipment fleet owners and general contractors, indicated that the report appeared to underestimate the sheer volume of construction equipment.

[18] Union of Concerned Scientists, Digging up Trouble: Construction Pollution in the Bay Area; http://www.ucsusa.org/assets/documents/clean_vehicles/Bay-Area-Fact-Sheet.pdf, accessed March 27, 2008.

[19] J.M. Burke and K.L. Johnson, Ammonium Sulfate and Bisulfate Formation in Air Preheaters, Report EPA-600/7-82-025a, April 1982.

[20] John H. Seinfeld and Spyros N. Pandis, Atmospheric Chemistry and Physics, John Wiley & Sons, Inc., New York, 1998.

[21] S. Matsuda, T. Kamo, A. Kato, and F. Nakajima, Deposition of Ammonium Bisulfate in the Selective Catalytic Reduction of Nitrogen Oxides with Ammonia, Ind. Eng. Chem. Prod. Res. Dev., v. 21, 1982, pp. 48-52.

[22] J.M. Burke and K.L. Johnson, Ammonium Sulfate and Bisulfate Formation in Air Preheaters, Report EPA-600/7-82-025a, April 1982.

emissions of VOCs from the Facility. Fugitive emissions from the Casa Diablo Complex are likely to be substantial given the acceptable fugitive loss rate project for the CD-IV project.

The Draft EIS/EIR states that fugitive n-pentane emissions from the CD-IV Project will substantially exceed the emission rates designated by ICAPCD. The DEIS/DEIR states "[t]he fugitive n-pentane, which is considered an ROG (reactive organic gas), would be released to the atmosphere or would leak into the geothermal lines, as a result of fugitive leaks of vaporized n-pentane from the valves, connections, seals, and tubes of the closed power plant motive fluid system.[23] The Applicant has estimated a maximum fugitive n-pentane leak rate for the CD-IV Project of 410 lbs/day (74.825 tons/year), and has requested this amount as permit limit from the GBUAPCD. (*Id.*)

I14-109 cont.

The Project's own 410 lbs/day estimate significantly exceeds the ICAPCD operational emissions of ozone precursor ROGs of just 55 lbs/day (almost 8 times higher), is almost double the GBUAPCD's best available control technology ("BACT") threshold of 250 lbs/day for VOC emissions from stationary sources, and does not include emissions from the rest of the Casa Diablo Complex.[24] Operational emissions from CD-IV are substantial and qualify as a significant air impact. The Draft EIR/EIS must be revised to fully analyze and mitigate this per se significant impact.

V. Failure to Perform An Odor Analysis

I14-110

According to the DEIS/DEIR odor impacts were identified as less than significant requiring no further analysis. Existing sources of odors that could affect the proposed project were not properly identified. The

[23] BLM. 2012. Casa Diablo IV Geothermal Development Project Public Draft Joint Environmental Impact Statement and Environmental Impact Report. State Clearinghouse No. 2011041008. Pg 4.2-4

[24] BLM. 2012. Casa Diablo IV Geothermal Development Project Public Draft Joint Environmental Impact Statement and Environmental Impact Report. State Clearinghouse No. 2011041008. Pg 4.2-4

project has the potential to release large quantities of hydrogen sulfide, H_2S, a known irritant.

CARB investigated the ability of H_2S to cause annoyance to the general population. This study (CARB 1985,[25] p. 2), concluded that "an unpleasant odor is at or above the threshold of annoyance for half the people, when its concentration reaches 5 times the average threshold of detection." Recent work using reliable test methods indicates that the detectable threshold for H_2S ranges from 0.4 $\mu g/m^3$ (in studies in the Netherlands using a dynamic flow method) to 0.7 $\mu g/m^3$ (in studies in Japan using a static test method in an odor-free test room[26]). Thus, the concentration of H_2S that would annoy half the people would range from 2 $\mu g/m^3$ to 3.5 $\mu g/m^3$.

I14-110 cont.

This is consistent with conclusions reached by the World Health Organization (WHO), which considered that a level of 0.008 mg/m^3 (0.005 ppm) averaged over 30 min should not produce odour nuisance in most situations.[27] Extrapolating this to a 1-hour averaging time, this is equivalent to 3.5 ug/m^3 for a 1-hour exposure. These values are consistent with the annoyance range of 2 to 3.5 ug/m^3 estimated using CARB guidance.

The Proponent must adequately document the sources of potential odors, perform dispersion modeling of the sources to determine the ground level concentrations in the affected community, and determine the frequency of exceedences in the community from the releases at the project. This information must be included in a SEIR.

[25] John E. Amoore, The Perception of Hydrogen Sulfide Odor in Relation to Setting an Ambient Standard, Prepared for California Air Resources Board, ARB Contract A4-046-33, April 10, 1985.

[26] Y. Hoshika and others, International Comparison of Odor Threshold Values of Several Odorants in Japan and in The Netherlands, Environmental Research, v. 61, 1993, pp. 78–83.

[27] World Health Organization, Hydrogen Sulfide, Environmental Health Criteria No. 19, 1981, p. 13; National Research Council, Hydrogen Sulfide, University Park Press, Baltimore, 1979; T. Lindvall, On Sensory Evaluation of Odors Air Pollutant Intensities, Nord. Hyg. Tidskr., Supplement v. 2, 1970, pp. 1-181.

Conclusion

The facts identified and referenced in this comment letter lead me to reasonably conclude that the Project will result in significant adverse impacts that were not identified in the DEIS/DEIR and that are not adequately mitigated. Many of the DEIS/DEIR's conclusions that environmental impacts are not significant or less than significant with mitigation are unsupported or contradicted by the evidence. As a result, several analyses presented in the DEIS/DEIR, including impacts on air quality fail to identify or disclose the magnitude of significant adverse impacts. To protect air quality and public health the Proponent must prepare a SEIR for the Project. I14-111

Sincerely,



James Clark, Ph.D.

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February 1, 2013

Via Electronic Mail and US Mail

Attn: Mr. Collin Reinhardt, Project Manager
Casa Diablo IV Geothermal Development Project Draft EIS/EIR
BLM, Bishop Field Office
351 Pacu Lane, Suite 100
Bishop, CA 93514
Fax: (760) 872-5050
Email: cabipubcom@ca.blm.gov; creinhardt@blm.gov

Re: Comments on Casa Diablo IV Geothermal Development Project Draft EIS/EIR (CACA 11667).

Dear Mr. Reinhardt:

Bishop residents Russell Covington, Robert A. Moore, Randy Sipes, and Randal Sipes ("Bishop Residents"), hereby join in the comments of Laborers International Union of North America, Local Union 783 ("LIUNA"), submitted January 30, 2013, regarding the Draft Environmental Impact Statement ("EIS") / Environmental Impact Report ("EIR") (collectively, "Draft EIS/EIR") for the Casa Diablo IV Geothermal Development Project (CACA 11667), DOI Control No. DES 12-21, Publication Index No. BLM/CA-ES-2013-002+1793, State Clearinghouse No. 2011041008, including the construction, operation, maintenance and decommissioning of a 33 megawatt (MW) geothermal power generating facility and related infrastructure near Mammoth Lakes in Mono County, California (collectively "Project," "Casa Diablo Project" or "CD-IV Project").

The Bishop Residents live approximately 40 miles from the proposed Project area, and frequently visit the Mammoth Lakes area in Mono County in the direct vicinity of the Project site. The Bishop residents enjoy the beauty of the natural environment of Mono County, and Mammoth Lakes in particular, and regularly recreate there. The Bishop residents will be directly affected by the Project's impacts on the natural environment, including in particular, its impacts on sensitive and special-status species, such as bald and golden eagles, bats, American badger and other species identified in the Draft Environmental Impact

I15-1

Statement / Environmental Impact Report ("EIS/EIR") and in the comments of expert wildlife biologist Dr. Shawn Smallwood, Ph.D.

I15-1 cont.

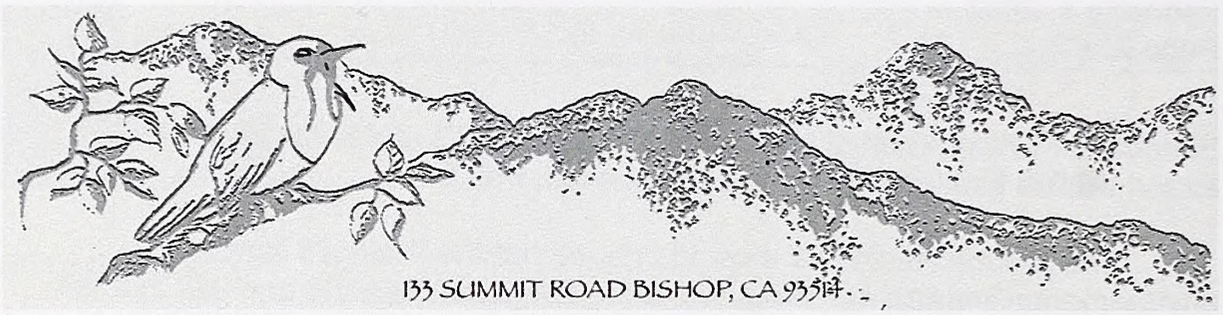
The Bishop Residents want to ensure that the Project's significant environmental impacts are mitigated to the full extent feasible and ask that the reviewing agencies to go back and prepare a legally adequate EIS/EIR for the Project, consider a reasonable range of Project alternatives, and implement all feasible mitigation measures to reduce Project impacts to a less than significant level.

I15-2

Please incorporate these comments into the administrative record for the Casa Diablo Project. Thank you.

Sincerely,

Richard T. Drury
Christina M. Caro
Lozeau Drury LLP
Counsel for the Bishop Residents



January 27, 2013

Ms. Bernadette Lovato
Bishop Field Manager
Bureau of Land Management
351 Pacu Lane, Suite 100
Bishop CA 93514

Dear Ms. Lovato:

I fully support the Ormat Nevada Incorporated Casa Diablo IV Geothermal Development Project proposal to construct, operate, maintain, and decommission a 33-megawatt geothermal power generating facility in the Town of Mammoth Lakes and Mono County, California. **I16-1**

I understand that some Mammoth Lakes residents are concerned with the impacts this project may have on recreationists' ability to fully enjoy the Shady Rest area. Over the last two decades, I have witnessed the degradation of the Shady Rest area due to increased vehicular use, new road and trail creation, trash dumping, use as a party location, and air pollution from road/trail dust and OHV/snowmobile exhaust. Shady Rest is far from a pristine area; therefore, I do not feel it will be unduly harmed by some new geothermal infrastructure and pipelines. Nevertheless, this area is a popular recreation location for Mammoth Lakes residents and the EIS/EIR should reflect a consideration for this use and an assurance that the project will not obstruct recreational access. **I16-2**

A closed circuit geothermal facility is far superior to all the other power generating proposals the BLM has entertained in the Eastern Sierra over that last few years, such as wind farms on the Adobe Range and solar farms on the Dry Owens Lake. Ormat has proven itself to be a conscientious corporation with a high-quality operation track record in the Mammoth Lakes area. I urge the BLM to fully approve the Casa Diablo IV Project. There is no better way to produce energy in the Eastern Sierra. **I16-3**

Thank you,

Liz O'Sullivan

Reinhardt, Collin <creinhardt@blm.gov>

Ormat Mammoth Geothermal Plant

1 message

Dan McConnell <danmcconnell55@gmail.com> Sat, Feb 23, 2013 at 1:05 PM
To: creinhardt@blm.gov

I have been following Ormat's plan to build a new power plant (CD-4) in place of it's existing plant. Up to 16 new wells in 18 locations could be drilled during the life of the project. The project has been held up due to a lawsuit by a Union Advocacy group. And, by objection of the above surface pipe system from recreation users in the area.

It seems to make sense to mitigate some of these objections by finally requesting that Ormat study and enact a Geothermal Heating District. Therefore sharing the geothermal source with the USFS and The Town of Mammoth Lakes. A good experiment would be to bring heat to the sidewalks along Old Mammoth Road and Main Street. The sidewalks are already plumbed for this use. I17-1

This would be a good way for the parties involved to get their feet wet.

Sincerely,
Dan McConnell
Mammoth Resident

CASA DIABLO IV GEOTHERMAL DEVELOPMENT PROJECT

PUBLIC COMMENT

--000--

REPORTER'S TRANSCRIPT OF PROCEEDINGS

MAMMOTH LAKES COMMUNITY CENTER

1000 FOREST TRAIL

MAMMOTH LAKES, CALIFORNIA 93546

WEDNESDAY, DECEMBER 5, 2012

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REPORTED BY: JUDY M. BERGMAN, CSR NO. 12781
FILE NO.: A60BC0D

A P P E A R A N C E S

FOR ENVIRONMENTAL SCIENCE ASSOCIATES

BY: MR. MICHAEL MANKA, Senior Managing Associate
1425 North McDowell Boulevard
Suite 105
Petaluma, California 94954
(707) 795-0900

ALSO PRESENT:

MARGIE DEROSE, Forest Service

BERNADETTE LAVOTO, Field Manager, BLM

STEVE NELSON, Assistant Field Manager, BLM

COLLIN REINHARDT, Project Manager, BLM

JAN SUDOMIER, GBUAPCD

GENE SUEMNICHT, EGS

MAMMOTH LAKES, CALIFORNIA

WEDNESDAY, DECEMBER 5, 2012

6:45 P.M.

-o0o-

MR. JOHN WALTER: Just a couple of things that's -- since we commented on -- I'm John Walter, Advocates for Mammoth. I'm also retired conservation chair of the Sierra Club.

But the last one, I want -- I'm particularly concerned with the use of the area in recreation, in terms of my comments tonight. And -- I've noticed a few things, since we commented on this during the scoping. And one is, last winter I noticed a definite smell from the wells, which I'd never really noticed before.

O1-1

I'm wondering if -- you know, if you've analyzed what kind of emissions, how many parts per billion it takes to smell it. It certainly interfered with the recreation experience, and it -- the other thought is, it could be contributing to greenhouse gases and/or a hazard.

O1-2

The other one was -- is noise. Skiing past, say, a hundred yards away from the operating wells -- now, you know, it's not like being on a county road or something, when you go out to have the quiet of skiing

O1-3

and you hear a definite, sort of, grinding away in the background. It was certainly noticeable, and I -- I think you ought to, you know, look -- look at the levels -- in terms of recreation of people that are out there -- for quiet.

O1-3 cond't

Those are the -- the other thing is, is that the -- it's not just the road crossings that interfere with -- the pipeline crossings that interfere with cross-country skiing. I've talked to you about night people following one of the main trails, but just wanting to be able to go out in the area.

O1-4

And that is, if you have a complete network of roads, and you have a winter like last winter, it's just about impassable because you have to take your skis off and get your ice ax out and climb down an ice wall to get across the road and get back up again.

Last winter it was no problem. We kind of made a deal two winters ago with Larry at that -- he had his guy that came out and plowed the roads, broke down some banks for us, so we could get through. And if there was a big commitment to that in there somewhere, I think it would be good.

O1-5

I guess the other was -- just sort of a question. Is the -- I'm sorry; I haven't read it all completely yet. Is the system complete -- air-cooled

O1-6

system like the -- the old one, or are there any attempts to use fluid cooling?

O1-6 cont'd

MR. MICHAEL MANKA: It's a completely air-cooled system --

MR. JOHN WALTER: Okay.

MR. MICHAEL MANKA: -- for all three of the action alternatives, Alts 1, 2, and 3.

MR. JOHN WALTER: Thank you.

MR. MICHAEL MANKA: Thank you, John.

(The public hearing proceedings concluded at 6:48 p.m.)

REPORTER'S CERTIFICATE

STATE OF CALIFORNIA)
) ss.
COUNTY OF RIVERSIDE)

I, JUDY M. BERGMAN, CSR No. 12781, a Certified Shorthand Reporter for the state of California, do hereby certify:

That the said public hearing was taken before me at the time and place therein stated and was thereafter transcribed into print under my direction and supervision. And I hereby further certify that the foregoing proceeding is a full, true and correct transcript of my shorthand notes so taken.

WITNESS my hand this 10th day of December 2012.

_____

JUDY M. BERGMAN, C.S.R. NO. 12781

ATTACHMENT G1
Exhibits to Comment Letters I9 and I14

The exhibits to Comment Letters I9 and I14 are provided on CD.

NOTE: This is a public document, Comment Letter I9, Exhibits E, G, K, L, N, O, P, Q, T, U, and V are available online http://www.blm.gov/ca/st/en/fo/bishop.html.

APPENDIX H
Responses to Comments

In this section, responses are provided for each comment received on the Draft Joint EIS/EIR. Comments received from an agency are coded A-X where X is the number of the comment. Comments received from individuals or interested organizations are coded I-X. All comment letters, coded to delineate comments as described above, are provided in Appendix G.

Letter A1 – Responses to Comments from Native American Heritage Commission

A1-1 The BLM and USFS value Native American participation. In accordance with government-to-government consultation requirements, the agencies have contacted the listed Native American groups by letter, telephone calls, and in-person meetings (see Section 6.2.1, *Native American Government to Government Consultation*). Agencies will continue consultation efforts; this is reflected in current mitigation measures. No changes to current text are required.

A1-2 As noted in Response A1-1, the BLM and USFS value Native American consultation, and have made efforts to contact local tribal groups. As discussed in Section 6.2.1 and Section 4.6, *Cultural Resources*, the BLM and USFS have engaged in consultation for the CD-IV Project consistent with all applicable requirements of Section 106. The MOA reflects the importance of Native American participation in the process, as does the Historic Properties Avoidance Plan. No changes to current text are required.

A1-3 The BLM and USFS will not disclose the presence or location of religious or culturally significant resources, other than to erect the resource protection barriers described in the Historic Properties Avoidance Plan. No changes to current text are required.

A1-4 Procedures for dealing with the accidental discovery of human remains are outlined in the Historic Properties Avoidance Plan which can be found as an appendix to the Memorandum of Agreement. No changes to current text are required.

A1-5 The commenter is referred to Response A1-1. No changes to current text are required.

A1-6 Project alternatives have been developed to avoid known cultural resources within the Project area, as discussed in Tables 4.6-1 and 4.6-2 in Section 4.6, *Cultural Resources*. The only alternative that would avoid all cultural resources is the No Action Alternative. No changes to the text are required.

Letter A2 – Responses to Comments from Caltrans

A2-1 The commenter is correct that the proposed recycled water pipe line in the vicinity of SR is not included in the CD-IV Project.

A2-2 The commenter's characterization of the CD-IV Project's impact to State highway traffic is correct. As stated on page 4.16-5 of the Draft EIS/EIR (Project Design Measures TR-1), for construction of a pipeline under U.S. Highway 395, ORNI 50, LLC will satisfy Caltrans' encroachment permit requirements.

Letter A3 – Responses to Comments from Long Valley Fire Department

A3-1 Figure 3.10-1 has been revised to show the service area of the Long Valley Fire Protection District Boundary and Sphere of Influence.

A3-2 The commenter states that the Long Valley Fire Protection District is working on the proposed construction of the CD-IV Project in regards to fire code compliance. No response required.

Letter A4 – Responses to Comments from Town of Mammoth Lakes

A4-1 The commenter is referred to the Draft EIS/EIR Figures 2-2, 2-13 and 2-14 for depictions of the alternative pipeline layouts. These figures show areas where single, double, and triple pipelines may be present under the various alternatives. None of the alternatives would result in areas containing four pipelines. Table 2-1 summarizes the length of pipeline by alternative and specifies the length of single and double pipeline. Section 2.2.5.1 describes the pipeline diameter (maximum 28 inches) and width between pipelines as approximately 24 inches resulting in areas containing three parallel pipelines as approximately 12 feet wide. In order to provide additional clarification, the text in Section 2.2.5.1 has been clarified as follows:

> The injection pipeline would parallel the new production pipeline and the existing Basalt Canyon pipeline for much of its route. The injection pipeline would be the same height as the production pipeline, with about 24 inches (61 cm) between the pipelines. <u>In areas where two project pipelines would parallel the existing pipeline</u>~~Together,~~ the three ~~pipelines~~ <u>pipeline corridor</u> would be approximately 12 feet (3.7 meters) wide. <u>In areas where two project pipelines would be constructed parallel to each other but not adjacent to the existing pipeline the corridor would be approximately 7 feet wide.</u>

A4-2 The commenter asserts that the Draft EIS/EIR incorrectly identifies that Mono County maintains several roads in the Project area, including Sawmill Cutoff Road and Sawmill Road. The commenter states that the Town of Mammoth Lakes maintains Sawmill Cutoff Road from SR203 to the end of the asphalt pavement near Shady Rest Park (O3S308) and

Shady Rest Park access road (03S08N and 03S08P). Pursuant to email communication with Jeff Walters, Director of Road and Fleet Services for the Mono County Department of Public Works, Mono County does maintain Sawmill Road from near the junction of State Route 203 and U.S. Highway 395 to the junction of Sawmill Cutoff Road. (Mono County, 2013). ESA performed a global search of the Draft Joint EIS/EIR and found that only Sawmill Road is identified as a county-maintained road. Chapter 2 has been amended to indicate that the Town of Mammoth Lakes maintains Sawmill Cutoff Road from the intersection with SR 203 to the end of the pavement near Shady Rest Park (O3S308) and Shady Rest Park access road (03S08N and 03S08P). A footnote has been added to the text on page 2-18 to clarify the jurisdiction of Mono County:

> Approximately, 0.61 mile of unauthorized roads would be added to the NFSR to be used as access roads. Sawmill Road (03S25) (a County-maintained road[1]), Sawmill Cutoff Road (NFSR 03S08) (maintained by the Town of Mammoth Lakes[2]), and Pole Line Road (NFSR 03S123) are all improved dirt roads that provide general access to the western portions of the wellfield and pipeline route.
>
> [1] Mono County maintains Sawmill Road (03S25) from near the junction of SR 203 with U.S. Highway 395 to the junction with Sawmill Cutoff Road (NFSR 03S08).
>
> [2] Under permit from the USFS, the Town of Mammoth Lakes maintains Sawmill Cutoff Road from the intersection with SR 203 to the end of the pavement near Shady Rest Park (O3S308) and Shady Rest Park access road (03S08N and 03S08P).

A4-3 The commenter provided details pertaining to permitting within the Town of Mammoth Lakes municipal boundary. This information has been added to Section 1.6.2 as follows:

> If required, ministerial building permits for construction of some aspects of the CD-IV Project would be granted by the Building Division of the Mono County Community Development Division.
>
> As discussed above in Section 1.5.3.2 and further in Section 3.10.2.3, a portion of the pipeline constructed under the Proposed Action and Alternatives would be constructed within the Town of Mammoth Lakes municipal boundary and may be subject to Town of Mammoth Lakes permitting requirements, including building permits and addressing requirements, unless exempted by the USFS.

A4-4 The commenter asserts that the air quality analysis contained in the Draft EIS/EIR is insufficient because it does not analyze the CD-IV Project's consistency with the Town of Mammoth Lake's Air Quality Management Plan and associated ordinance. Section 3.2.2.3 of the Draft EIS/EIR summarizes the Town's Air Quality Management Plan and conformance with the Air Quality Management Plan is analyzed in Section 4.2.4.2 on Draft EIS/EIR page 4.2-13.

Mammoth Lakes Air Quality Management Plan Section 8.30.110, *Road Dust Reduction Measures*, contains two subparts, A and B. Subpart A instructs the Director of Public Works to undertake a vacuum street sweeping program to reduce PM10 emissions resulting

from excessive accumulations of cinders and dirt. This does not apply to the CD-IV Project. Subpart B states that "The Town shall, in its review of development projects, incorporate such measures which reduce total vehicle miles travelled. Examples of such measures include, but are not limited to, circulation system improvements, mass transit facilities, private shuttles, and design and location of facilities to encourage pedestrian circulation. The goal of the Town's review shall be to limit peak vehicle miles travelled to 106,600 on any given day."

Implementation of Subpart B is under the discretion of the Town of Mammoth Lakes and would only be applicable to components of the CD-IV Project that are within the municipal boundaries of the Town of Mammoth Lakes and require development permits. The last sentence of the first paragraph of the Draft EIS/EIR page 3.2-8 has been amended as follows to reference the goal of reducing emissions from re-entrained road cinders:

> The plan adopted regulations that phased out non-certified wood stoves and fireplaces, limited the installation of stoves and fireplaces to one certified unit per residence, prohibited trash and coal burning, ~~and~~ established triggers for no burn days, and reduced emissions from re-entrained road cinders (GBUAPCD and Town of Mammoth Lakes, 1990).

In addition, the following discussion has been added after the first paragraph on Draft EIS/EIR page 3.2-8 to acknowledge the Town of Mammoth Lakes Municipal Code Chapter 8.30:

> ***Town of Mammoth Lakes Municipal Code***
>
> Chapter 8.30 of the Town of Mammoth Lakes Municipal Code largely implements mitigation measures proposed in the Air Quality Management Plan for the Town of Mammoth Lakes. The majority of this chapter does not apply to the CD-IV Project as it establishes standards and requirements for solid fuel appliances and the CD-IV Project would not include the use of any solid fuel appliances. Section 8.30.100 requires the Town of Mammoth Lakes to undertake a street sweeping program to reduce PM10 emissions resulting from excess accumulation of cinders and dirt. This chapter directs the Town to reduce vehicle miles traveled (VMT) associated with a project through its review of proposed development projects.

The impact discussion for criterion A on Draft EIS/EIR page 4.2-13 has been amended as follows to disclose that the CD-IV Project would be in conformance with Section 8.30.110 of the Town's Air Quality Management Plan. The text has been added as follows:

> The Air Quality Management Plan for the Town of Mammoth Lakes was implemented in an attempt to bring the area into compliance with federal and state PM10 air quality standards. The plan adopted regulations that reduced emissions from reentrained road cinders, phased out non-certified wood stoves and fireplaces,

limited the installation of stoves and fireplaces to one certified unit per residence, prohibited trash and coal burning, and established triggers for no burn days. The CD-IV Project would not include fires of any kind (see Section 2.2.8, DPM Haz-6)~~; therefore, construction, operation and maintenance, and decommissioning activities associated with the CD-IV Project would not conflict with or obstruct the Air Quality Management Plan for the Town of Mammoth Lakes. There would be no impact~~. Emissions associated with reentrained road cinders are controlled by limiting peak vehicle miles travelled (VMT) to 106,600 on any given day. Based on trip and mileage data presented in Appendix C, operations of the CD-IV Project would only result in a total VMT of up to 140 each day, and construction would temporarily result in a total VMT of up to 8,460 per day. Only a small fraction of the CD-IV Project VMTs would occur within the Town. Therefore, it is unlikely that the CD-IV Project would conflict with or obstruct the Town's Air Quality Management Plan. There would be no impact.

A4-5 Policy S.3.W is identified in the Draft EIS/EIR in Section 3.10, *Land Use*, on page 3.10-11. As noted in Section 4.10.1, *Methodology for Analysis*, the analysis of land use impacts for the CD-IV Project examines issues related to land use compatibility, disruption of an existing community, conflicts with habitat conservation or natural community conservation plans, and consistency with adopted land use plans, policies, and regulations. Jurisdiction of the Town of Mammoth Lakes over the Project is discussed on page 4.10-4. The proposed geothermal power generating facility would be located outside the Town's Municipal Boundary. A portion of the well pipeline and some wells would be located within this boundary. However, the land on which these components would be sited is designated as *National Forest (NF)* by the Town's General Plan, which is not subject to the jurisdiction of the Town of Mammoth Lakes. Policy S.3.W states that the Town shall work with LAFCO to review the Municipal Boundary regarding new geothermal facilities located west of U.S. Highway 395. The application of this policy to the CD-IV Project would not result in any inconsistency with the General Plan regarding potential environmental effects.

The commenter implies that the Project will result in fiscal impacts resulting from increased demand for Town services. Section 4.17 of the Draft EIS/EIR describes the Project's effects on public utilities and services.

The commenter's position that the applicant could bear the cost of preparing a LAFCO study to determine if annexation of the land containing project facilities is warranted, is beyond the scope of the Draft EIS/EIR and not subject to analysis.

A4-6 The commenter indicates that the analysis does not provide an adequate assessment of impacts on recreational uses. The comment does not provide specific examples of inadequacy, but additional comments discussed below do include greater detail. This comment is noted.

A4-7 The commenter indicates that the Project would change the experience of motorized and non-motorized users of the Shady Rest trailhead, and that recreation options from the

trailhead to the south and west will be impeded. The Draft EIS/EIR describes visual changes that would occur in the Shady Rest Park area, as well as impacts of the Project on winter transportation from the over snow vehicle (OSV) staging area. As discussed on Draft EIS/EIR page 4-6, pipelines will be located away from existing roads and/or screened by existing vegetation or terrain (PDM VIS-2). The pipelines in visually sensitive areas, all wells, and the power plant will be of textures and color/colors that blend in with the environment (PDM VIS-3 and VIS-4). As described in Section 4.18, *Visual Resources*, recreationists along Sawmill Cutoff Road (NFSR 03S08) may notice the "expansion loops" or square bends along the production pipeline route, where the pipeline lengthens and shortens. To reduce the visual impact of the proposed geothermal pipeline in this area, ORNI 50, LLC would implement PDMs VIS-1 and VIS-3, which would require that any pipeline route selected within the pipeline corridor either be 300 feet from the developed portions of Shady Rest Park or be substantially screened from view from the developed portions of the park by topography or vegetation and that the selected pipeline route not parallel Sawmill Cutoff Road (NFSR 03S08) within 300 feet of the road.

As discussed on Draft EIS/EIR page 4.14-7, proposed well pipelines include a route that would run parallel to Sawmill Road (03S25), which serves as a popular recreation road and intersects with several other roads that serve recreational uses, particularly in the winter. Further, there are other locations where pipelines would cross NFSRs that provide recreation opportunities. During winter months, these roads are often used for snowmobiling and cross country skiing. The concentration of pipelines (including existing pipelines) and well facilities near Shady Rest Park and the existing OSV staging area could result in confusion and safety hazards as OSV users attempt to cross the Project area from the staging area to areas to the northwest commonly used for open riding. Under Alternative 1, related vehicles will be restricted to designated access routes and will be restricted to traveling no faster than 25 miles per hour on Sawmill Cutoff Road (NFSR 03S08) and other unpaved roads in the Alternative 1 area (PDM TR-7). It should be noted however that speeds of 25 miles per hour by operational vehicles could result in conflicts and public safety hazards with recreation use of the area, particularly in areas with blind corners, narrow roads, or hills.

Proposed facilities, plowing, and other road maintenance activities that would occur under the Project (as described in Section 2.2.7.3, *Access Road Maintenance and Plowing*) would change the nature of the recreation experience of the Project roads. Some recreationists would prefer to use the roads proposed under the CD-IV Project that would undergo more maintenance (i.e., fewer ruts, smoother surfaces), while other recreationists seeking a more rustic experience would prefer the less maintained conditions of roads that currently exist. Plowing and other road maintenance activities could encourage higher speeds by OSV and other motorized recreation uses. Mitigation Measure REC-3 would require that information regarding access routing be provided at nearby recreation sites / campgrounds, access points, and the Mammoth Lakes Visitor Center. In addition, operational vehicle speeds would be limited to 15 miles per hour and road signage would be installed, consistent with USFS and County requirements.

In response to this comment and comments A4-9, A4-10, A4-15, I2-2, I2-3, I2-4, I2-8, I6-1, I6-3, I7-3, I10-12, I10-13, I10-16, I10-17, I11-12, I11-14, I11-26, and I-11-27, page 4.14-7, paragraph 5 through page 4.14-8, paragraph 2 have been revised:

> Siting of Proposed Action facilities, as well as ~~P~~plowing and other road maintenance activities that would occur under the Project (as described in Section 2.2.7.3, *Access Road Maintenance and Plowing*) would change the nature of the recreation experience of the Project area~~roads~~. The geothermal plant, well facilities, and pipelines would introduce additional human made structures to the vicinity as viewed by road/trail users and cross-country recreation users. Some recreationists would prefer use of the roads under the CD-IV Project that have more maintenance (i.e., fewer ruts, smoother surfaces), while other recreationists seeking a more rustic experience would prefer the less maintained conditions of roads that currently exist.
>
> Proposed well pipelines include a route that would run parallel to Sawmill Road (03S25), which serves as a popular recreation road and intersects with several other roads that serve recreational uses, particularly in the winter. Further, there are other locations where pipelines would cross NFSRs that provide recreation opportunities. During winter months, these roads are often used for snowmobiling and cross country skiing. The concentration of pipelines and well facilities near Shady Rest Park and the existing over snow vehicle (OSV) staging area, coupled with the existing topography, trees, and grade changes in the area, could result in confusion and safety hazards as OSV and other recreation users attempt to cross the Project area from the staging area to areas to the northwest commonly used for open riding. Further, the siting of pipelines would affect cross country recreation opportunities. Plowing and other road maintenance activities could encourage higher speeds by OSV and other motorized recreation uses. In addition, plowing could create grade changes that could result in public safety impacts, particularly for cross-country OSV users that travel at rates of speeds such that grade changes may not be noticeable if they are not identified. Finally, Alternative 1-related vehicles will be restricted to designated access routes and will be restricted to traveling no faster than 25 miles per hour on Sawmill Cutoff Road (NFSR 03S08) and other unpaved roads in the Alternative 1 area (PDM TR-7). However, speeds of 25 miles per hour by operational vehicles could result in conflicts and public safety hazards with recreation use of the area, particularly in areas with blind corners, narrow roads, or hills.
>
> ~~Plowing and other road maintenance activities could encourage higher speeds by OSV and other motorized recreation uses.~~ Similar to the above description of winter recreation use, non-winter recreation users entering the Project area from Shady Rest Park would be somewhat constrained by the location of the pipelines, and conflicts between recreation users and with operational vehicles could occur. Further, the siting of pipelines would affect cross country recreation

opportunities. Road maintenance activities could encourage higher speeds by OHV and other motorized recreation uses. Finally, Alternative 1-related vehicles will be restricted to designated access routes and will be restricted to traveling no faster than 25 miles per hour on Sawmill Cutoff Road (NFSR 03S08) and other unpaved roads in the Alternative 1 area (PDM TR-7). However, speeds of 25 miles per hour by operational vehicles could result in conflicts and public safety hazards with recreation use of the area, particularly in areas with blind corners, narrow roads, or hills. **Mitigation Measure REC-3** would require that information regarding access routing be provided at nearby recreation sites / campgrounds, access points, and the Mammoth Welcome Center. In addition, operational vehicle speeds would be limited to 15 miles per hour and road signage would be installed, consistent with USFS and County requirements.

A4-8 The commenter indicates that mitigation measures and PDMs do not fully mitigate the effect of the Project on trails and non-system roads because pipelines should be underground wherever they cross any established trail or road, not just system roads. The CD-IV Project includes underground pipeline crossings at all identified roads, as shown on Figure 4.4-2. However, there may be a small segment of a groomed Nordic ski route that may need to be altered in the vicinity of wells 38-35 and 50-25. The proposed pipelines do not cross identified trail routes, except where they coincide with area roads. Furthermore, as identified in the Inyo National Forest Travel Management Plan, non-system roads are slated for closure to motorized use and eventual restoration. Since undergrounding pipelines at non-system road crossings would impede restoration of these road segments by encouraging continued use, undergrounding the pipeline at non-system road crossings is not considered.

A4-9 The commenter indicates that the effect of crossing plowed roads is not analyzed in the Draft EIS/EIR. See the response to comment A4-7, which includes a revision to Draft EIS/EIR page 4.14-7, paragraph 5 regarding OSV crossing of plowed roads. See also Response I10-24 for an addition to Mitigation Measure REC-3 requiring that grade changes resulting from road plowing be gradual in areas where cross country use is prevalent.

A4-10 The commenter indicates that the Draft EIS/EIR does not provide an adequate assessment of effects on summer recreation, particularly the blocking of trails and non-system roads. The impact discussion included in the Draft EIS/EIR applies to both summer, or non-snow periods, or winter use, as discussed on pages 4.14-4 thorough 4.14-11, with the exception of specific discussion of access from the Shady Rest Park OSV staging area and the effect of Project facilities on snowmelt. Regarding blocking of trails and non-system roads, as discussed in Response A4-8, the CD-IV Project includes underground pipeline crossings at all identified roads, as shown on Figure 4.4-2. The proposed pipelines do not cross identified trail routes, except where they coincide with area roads. Some non-system roads may be closed to motorized use, but would remain available to non-motorized recreation use. However, it is acknowledged that the presence of proposed

pipelines would affect cross country uses. See the text revision included in response to comment A4-7.

A4-11 The commenter indicates that multiple parallel pipelines results in additional obstacles and barriers. The Draft EIS/EIR indicates that the concentration of pipelines and well facilities near Shady Rest Park and the existing OSV staging area, the location where parallel pipelines would be located, could result in confusion and safety hazards as OSV and other recreation users attempt to cross the Project area from the staging area to areas to the northwest commonly used for open riding. Project-related vehicles will be restricted to designated access routes and will be restricted to traveling no faster than 25 miles per hour on Sawmill Cutoff Road (NFSR 03S08) and other unpaved roads in the Project area (PDM TR-7). However, speeds of 25 miles per hour by operational vehicles could result in conflicts and public safety hazards with recreation use of the area, particularly in areas with blind corners, narrow roads, or hills. Mitigation Measure REC-3 would require that information regarding access routing be provided at nearby recreation sites / campgrounds, access points, and the Mammoth Welcome Center. In addition, operational vehicle speeds would be limited to 15 miles per hour and road signage would be installed, consistent with USFS and County requirements.

A4-12 The commenter indicates that the analysis should include an estimate of the level of use of the Project area by recreationists. There is no available data quantifying recreation use in the Project area; however, the impact analysis acknowledges the area to be a popular recreation area and considers the potential for conflicts between recreation users and Project facilities, and construction and operation activities, as well as the change in recreation experience due to increased facilities and pipelines, and increased plowing and road maintenance activities.

A4-13 The commenter indicates that the analysis should address distribution and patterns of recreation use in the Shady Rest Park area related to obstacles and barriers created by new pipelines. See Response A4-7.

A4-14 The commenter indicates that a snowmobile concessionaire is being considered for operation at Shady Rest Park, which would result in an increase in winter use of the area. The USFS granted a one-time, temporary approval to the Smokey Bear Flat concessionaire to operate from Shady Rest Park for the 2012-2013 season, due to limited snow availability at Smokey Bear Flat. However, operation at Shady Rest Park for the 2012-2013 season was not necessary because snow at Smokey Bear Flat increased sufficiently. Demand for commercial OSV recreation during future drought years could similarly result in temporary approval to the Smokey Bear Flat concessionaire to operate elsewhere, but would be accommodated using the capacity of existing recreation infrastructure.

A4-15 The commenter indicates that the analysis does not consider topography, trees, and grade changes in the Shady Rest Park area that could result in safety hazards. See Response A4-7.

A4-16 The commenter indicates that the Draft EIS/EIR does not include an analysis of snowmelt along both aboveground pipelines and above buried pipelines. The commenter requests that the EIS/EIR describe such effects if the pipelines could increase snowmelt. As described on page 2-30 of the Draft EIS/EIR, the underground pipelines would be insulated and a 2 to 4 inch air gap would be maintained between the insulation and the casing pipe, which would also be insulated by filling the trench with Gilsulate 500 or DriTherm insulation powder. Thus, design measures and permit conditions would require underground pipelines to be sufficiently insulated and would be buried at an acceptable depth to avoid increased snowmelt. As described on page 2-28 of the Draft EIS/EIR, the aboveground geothermal production pipeline would be covered with about two inches of insulation.

A4-17 The comment is a summary statement that expresses disagreement with the analysis methodology and significance findings with regards to noise impacts on Shady Rest Park. This comment is noted. See Responses A4-18 through A4-21.

A4-18 The commenter indicates several well heads generating noise over 70 dBA would be audible from Shady Rest Park. To clarify, although well drilling and construction activities may result in temporary noise levels over 70 dBA at Shady Rest Park (see Table 4.11-3 on Draft EIS/EIR page 4.11-5), well head pump operations at Well 38-25 (the closest proposed well head to the park) are estimated to result in a noise level of approximately 53 dBA at the southeast perimeter of the park (see Table 4.11-5 on Draft EIS/EIR page 4.11-8). It should be noted that the southeast perimeter of the park consists of baseball outfields, and the closest non-baseball field related area at the park would be more than 600 feet from Well 38-25. At 600 feet, well head pump operations would be expected to generate a noise level of approximately 39 dBA.

The commenter also indicates that it is not possible to conclude that the noise impact at the park would be less than significant because no existing ambient noise levels were collected at the park. However, as disclosed in the third paragraph on Draft EIS/EIR page 3.11-7, it is estimated that daytime and nighttime noise levels at receptors in the Town (including Shady Rest Park and Shady Rest Campgrounds) would be as low as 40 dBA to 50 dBA and 30 dBA to 40 dBA, respectively, based on noise measurements collected near U.S. Highway 395 and the distance from the Town of Mammoth Lakes to U.S. Highway 395. These noise levels represent an L_{dn} range of 40 dBA to 50 dBA.

Although a significant environmental impact has not been identified associated with pump noise under CEQA, the USFS has recommended implementation of mitigation to ensure that there would be no adverse effects under NEPA related to well pump noise disturbance of Shady Rest Park users. Therefore, the following text on Draft EIS/EIR page 4.11-9 has been revised as follows:

> Noise levels from the well pump at Well Site 38-25 would likely be audible at the baseball fields at Shady Rest Park. ~~However,~~ Although well pump ~~the~~ noise would not be expected to be disruptive, considering the typically noisy nature of activities conducted at the park, the USFS has recommended implementation of

mitigation under NEPA to ensure that there would be no associated adverse effects related to disturbance of Shady Rest Park users (see Mitigation Measure NO-1). Noise levels at other receptors identified in Table 4.11-5 would be below ambient conditions and would not be expected to be audible.

Mitigation Measure NO-1 has been added to Final EIS/EIR Section 4.11.9 as follows.

Mitigation Measure NO-1: ORNI 50, LLC shall prepare and implement a Noise Management Plan to ensure that operational noise levels associated with CD-IV Project well pumps do not increase ambient noise levels at Shady Rest Park by more than 3 dBA. The plan shall be submitted to USFS for review and approval prior to the commencement of well pump operations. The plan shall include a proposal designed by an acoustical engineer to perform baseline noise measurements at Shady Rest Park at locations developed through consultation with USFS and the Town of Mammoth Lakes. The plan shall include a requirement for an acoustical engineer to collect additional measurements at the same locations as the baseline survey once the well pumps are operational to verify that well pump noise levels do not increase ambient noise levels by more than 3 dBA. The plan shall identify specific acoustical engineer-recommended measures to be implemented by ORNI 50, LLC in order to reduce noise levels to within 3 dBA of baseline conditions if the measurements that include pump operations exceed the baseline measurements by more than 3 dBA. Noise control techniques may include, but not be limited to: locating the well pump within an enclosed concrete building, use of noise walls or equivalent sound attenuation structures, and the use of pumps and equipment with special noise control specifications designed to specifically achieve the desired noise reductions.

The plan shall require an acoustical engineer to take additional noise measurements after the noise reduction improvements are implemented to ensure the required noise level is met. In the event that the measured noise levels still exceed the baseline level by more than 3 dBA, additional noise control techniques shall be initiated to correct the violation.

Final EIS/EIR Section 4.11.9 has been revised as follows.

~~No mitigation measures are recommended.~~ There would be no residual impacts after mitigation is incorporated.

A4-19 The commenter indicates that the CEQA significance threshold to determine impacts to Shady Rest Park and Shady Rest Campground should be an increase in 5 dBA over ambient levels when ambient levels remain below the Town's exterior standards and an increase in 3 dBA over ambient levels when ambient levels are above the Town's exterior standards. However, it technically would not be possible to assess noise levels at the park and campground using the suggested threshold because the Town's exterior standards are based on specific receiving land uses, none of which are related to a park or campground.

Instead, the Draft EIS/EIR noise analysis used the Town's most stringent exterior noise level standard (i.e., one and two family rural suburban residential) to address whether the CD-IV Project would result in an exceedance of a local noise standard. In addition, the analysis also identifies whether L_{dn} noise level increases associated with long-term operation and maintenance activities would exceed 3 dBA at sensitive receptor locations.

For the purposes of the noise analysis, the campground is considered to be a nighttime sensitive receptor that would be exposed to a pump noise level of up to 23 dBA L_{eq} and 29 dBA L_{dn}, which would be well below the Town's exterior noise standard for residential uses and would be less than the estimated ambient noise levels at the campground (see the Well Pumps impact discussion on Draft EIS/EIR page 4.11-8), resulting in an impact that is less than significant. As discussed in Response A4-18, the closest non-baseball field portion of Shady Rest Park to the proposed Well 38-25 site would be at a distance of over 600 feet from the well. This portion of the park where other recreation activities that are less noisy occur would be exposed to a well pump noise level of approximately 39 dBA. Although technically not considered to be a sensitive receptor due to the overall atmosphere of an active community sports complex, the well pump noise level at 600 feet would not be expected to exceed daytime ambient noise levels at the park. The impact would be less than significant under CEQA. However, Mitigation Measure NO-1 has been added to the EIS/EIR to ensure that noise generated by operation of the CD-IV Project, near Shady Rest Park, would be no higher than 3 dBA above baseline. The baseline noise measurements for Shady Rest Park would also be established by the Noise Management Plan required by Mitigation Measure NO-1.

For discussion related to the effects the CD-IV Project would have on recreational activity at Shady Rest Park, refer to Response A4-7.

A4-20 The commenter states that the cumulative effects on noise of multiple wells operating in close proximity to Shady Rest Park are not considered. With the exception of Well 38-25, which is estimated to result in a noise level of approximately 53 dBA at the southeast perimeter of the park (see Table 4.11-5 on Draft EIS/EIR page 4.11-8), the next closest proposed or existing wells are over 600 feet from the northern area of the park. As stated in Section 4.11, the representative noise level for a well is 58 dBA at 100 feet from the well pump. Using the excess ground attenuation rate of 7.5 dBA per doubling of distance, pump noise at 600 feet would be 39 dBA. In addition, the closest existing or proposed well site to Well 38-25 is approximately 700 feet to the east of the park. At 700 feet, pump noise levels would be expected to be approximately 37 dBA. Due to the logarithmic nature of decibels (see Draft EIS/EIR page 3.11-1), the combined noise level of the three operating wells would not exceed 53 dBA at any location at the park. Therefore, there would be no combined cumulative noise effect associated with the existing and proposed well pump noise at Shady Rest Park.

A4-21 The CD-IV Project would not result in a significant noise impact on Shady Rest Park; therefore, mitigation measures are not required under CEQA. However, per USFS

recommendations, Mitigation Measure NO-1 has been incorporated into the EIS/EIR. See Responses A4-18 through A4-20.

A4-22 Specific measures (PDM TR-2, TR-3, TR-6, and TR-7) were established and disclosed in the Draft EIS/EIR to reduce any adverse traffic effects to Sawmill Cutoff Road and Shady Rest Park during all seasons year long (see Section 4.16.2, *Project Design Measures*). For specific measures pertaining to public access and use of Sawmill Cutoff Road and Shady Rest Park, please Section 4.14.2 in *Recreation*. PDMs were supplemented with Mitigation Measure TRA-1 (see page 4.16-20), which requires the preparation of a Coordinated Transportation Management Plan and transportation management plan for roadways adjacent to and directly affected by the planned CD-IV Project facilities in coordination with Mono County. These plans would address transportation impacts of the overlapping construction projects within the vicinity of the CD-IV Project in the region.

A4-23 The commenter voices concerns that PDM TR6 will be inadequate to ensure that plowed access will be maintained to the Shady Rest parking lot and requests that PDM TR6 be amended to ensure meet Town of Mammoth Lakes and municipal code requirements. PDMs are protective measures proposed by the applicant and will not be amended by the EIS/EIR. However, concerns about the accessibility of Shady Rest Park are noted. See Response A4-9 for information on impacts of snow plowing on recreation and proposed mitigation measures. Mitigation Measure REC-3 includes a requirement that ORNI 50 LLC coordinate with the Town of Mammoth and the USFS to ensure that the Shady Rest OSV staging area and access to the staging area is plowed to provide winter access.

A4-24 Specific details pertaining to restrictions on traffic speeds for construction-related vehicles on Town-maintained roadways will be included in the encroachment process. Mitigation Measure REC-1 restricts construction vehicle speed to 15 miles per hour and requires temporary signage, warning construction vehicles to reduce speeds in areas with blind corners, narrow roads, or hills.

A4-25 The comment suggests that the visual impact analysis understates the visual impacts associated with the proposed geothermal pipelines. The comment also notes that any new screening vegetation would require several years to establish and even when fully matured, would not fully screen views from all public roads and trails. The comment recommends that the impact analysis, significance finding, and mitigation measures be revised.

The Draft EIS/EIR (Chapter 4, Section 4.18, page 4.18-1) summarizes the methodology for the visual resources analysis. Potential effects on visual resources are evaluated and based on relevant BLM stipulations (e.g., BLM Geothermal Leases CACA-14407 and CACA-14408 "No Surface Occupancy"), USFS Visual Management System's visual quality objectives (VQOs), and the CEQA criteria pertaining to visual resources. For the purposes of NEPA compliance, Section 4.13.4.1 of the Draft EIS/EIR uses the Visual Management System's VQOs to analyze the visual effects of the Proposed Action as prescribed by the Inyo Land and Resource Management Plan and provides mitigation measures that would reduce potential adverse visual effects. The NEPA analysis also evaluates whether the

Proposed Action would be consistent with the requirements of BLM Geothermal Leases. To better characterize the visual effects of the geothermal pipeline, Section 4.18.4.1 of the Draft EIS/EIR under the heading "Sawmill Cutoff Road and Shady Rest Park" (page 4.18-11) is modified as follows:

> .... However, ~~as shown in Figure 4.18-2~~similar to what is shown in Figure 3.18-4, a segment of the pipeline connecting to well facility 15-25 would parallels Sawmill Cutoff Road (~~03S25~~NRSR 03S08) within 300 feet of the road~~, which~~. Although the pipeline would be built low to the ground, due proximity, the top of the pipeline would often be visible above adjacent vegetation from Sawmill Cutoff Road; therefore, the pipeline near well facility 15-25 would result in an inconsistency with the VQO of "retention" for this portion of the Project area. Similarly, near well facilities 14-25 and 34-25, the proposed geothermal pipeline would cross Sawmill Cutoff Road (NRSR 03S08). Although the pipeline would be constructed beneath the road, recreationists would have immediate views of the pipeline on either side of Sawmill Cutoff Road (NRSR 03S08), which would be clearly visible above vegetation on either side of the road and would also result in an inconsistency with the VQO or "retention" within this area of the Project area. ...

The first incomplete paragraph on page 4.18-15 is also modified as follows:

> ... However, because portions of the pipelines would be visually evident from SR 203, the pipelines would still be noticeable and would introduce a smooth texture that is not apparent in the existing characteristic landscape; therefore, views of the pipeline segments from SR 203 would substantially alter the visual landscape and would be inconsistent with the VQO of "retention" prescribed for this portion of the Project area...

The third paragraph on page 4.18-18 is modified as follows:

> .... As described in Section 4.18.4.1, ~~C~~construction of well facilities, widened roads and geothermal pipelines immediately adjacent to Sawmill Cutoff Road (NFSR 03S08), and Shady Rest Park would also be readily visible and could substantially alter views from these recreational areas...

For the purposes of CEQA compliance and as summarized on page 4.18-19 in the Draft EIS/EIR, implementation of PDMs and Mitigation Measures VIS-1 (Landscape Plan) and VIS-2 (Pipeline Crossovers and Expansion Loops) would reduce construction and operation impacts associated with the Proposed Action. Note that the evaluation of the Proposed Action's consistency with the USFS Visual Management System's Visual Quality Objective (VQO) areas is not considered in the CEQA analysis. However, even with implementation of these measures and when viewing the Proposed Action collectively, the proposed geothermal pipeline would introduce a smooth texture that is not apparent in the existing natural landscape and would be visually evident from several publicly accessible areas. As such, the Proposed Action would result in a substantial

adverse effect on the visual character of the quality of the site and its surroundings, resulting in a CEQA significant and unavoidable impact. For an overview of text revisions to Mitigation Measures VIS-1 and VIS-2, please refer to Responses I8-36 and I8-37, below. Even with these revisions, the GBUAPCD and its analysts conclude that the mitigation measures proposed meet the CEQA standards but would not reduce this impact to less than significant. The CEQA significance determination of "significant and unavoidable" remains unchanged.

A4-26 The commenter states that impacts to the Town of Mammoth Lakes' sediment basins should be addressed, and further that the analysis should include the increased use of non-paved roads. The Draft EIS/EIR concludes that the Proposed Action and Alternatives would not significantly impact erosion processes or water quality, and thus there would be no significant impact to the town's sediment basins. Further, erosion and water quality issues, including those relating to existing roads, are addressed in the Draft EIS/EIR Section 4.19.4.1.

A4-27 The comment states that the Draft EIS/EIR does not provide sufficient analyses on shallow groundwater impacts to determine if impacts to local groundwater supplies would occur. The Draft EIS/EIR Section 4.7.4.1 and Appendix D present a summary of the extensive data accumulated in over 30 years of study on the Long Valley Caldera that indicate that a distinct separation between the geothermal reservoir and the drinking water aquifer exists, therefore, increased pumping of the geothermal reservoir is not expected to affect the availability or quality of groundwater resources used for drinking water supply. The analysis presented in the Draft EIS/EIR was based on the geologic setting, historic monitoring of the shallow groundwater system, and the geochemistry of reservoir and aquifer fluids. Additional discussion regarding the potential impacts on groundwater resources is presented in Section 6.4.3 of the Final EIS/EIR, Common Response 5 on Groundwater Resources.

A4-28 The commenter states that the Town of Mammoth Lakes shares similar concerns with MCWD regarding the potential impacts of the Project on groundwater resources. Please refer to the responses to the MCWD comments (Letter A10) for further information.

A4-29 The six new full-time employees would be in addition to the personnel already employed at the existing Casa Diablo geothermal complex, who currently provide staffing for operations and emergency needs. The geothermal complex would continue to be staffed 24/7 with a combination of existing and new employees (ORNI 50 LLC, 2013).

A4-30 Section 3.15.1 of the Draft EIS/EIR acknowledges the seasonal nature of second and vacation homes in Mono County. The rental vacancy rates used in this section are provided by the 2010 U.S. Census. The number used for "Vacant housing units - for rent" (1,125 units; Table 3.15-5) differs from "Vacant housing units - For seasonal, recreational, or occasional use." The 2000 U.S. Census, on which the most recent Town of Mammoth Lakes General Plan Housing Element relies for data about housing vacancy, found that there were a total of 445 vacant for rent units in the Town of Mammoth Lakes,

and 543 vacant for rent units in Mono County as a whole (Town of Mammoth Lakes, 2010; U.S. Census Bureau, 2000).[1] However, from the 2000 to the 2010 U.S. Census, the total number of vacant for rent housing units in the Town of Mammoth Lakes grew from 445 to 1,016, and the total number of same in Mono County grew from 543 to 1,125 (U.S. Census Bureau, 2010). By contrast, in both Census years for both geographies, the number of vacant housing units for seasonal, recreational, or occasional use was much higher, with a total of 6,383 such units in Mono County in 2010.

Because vacant units for seasonal, recreational, or occasional use may not be available to temporary construction workers throughout the Proposed Action construction period, either due to occasional occupancy or high cost, the statement in the Draft EIS/EIR that these units may be available to workers has been removed. Additionally, information has been added about average construction wages and the potential for workers moving from outside the County to increase demand for and prices of rental housing. In response to this comment, the following revisions have been made to Draft EIS/EIR Section 4.15, *Socioeconomics and Environmental Justice*, pages 4.15-3 and 4.15-4, fifth and sixth paragraphs under Section 4.15.4.1:

> Mono County is characterized by relatively high vacancy rates in its rental housing market, as was presented in Section 3.15.1. If all of the 134 construction workers expected to come from outside the region (i.e., 180 total minus 46 local Mono and Inyo residents) were to rent housing in Mono County, there are more than 1,000 vacant units currently for rent on a long-term basis~~, and another 6,000 units available for seasonal, recreational, or occasional use within the county~~. The Mono County housing market could ~~easily absorb~~ accommodate the entire anticipated peak workforce without generating any direct displacement in the housing market.
>
> A temporary increase in the number of occupied units in rental housing, hotels, and RV/campgrounds during the two-year construction period would be perceived as beneficial by ~~most people in Mono County~~ owners of such housing types and businesses that would be supported by the beneficial economic effects of increased occupancy. However, in 2011, the average annual wage for construction workers in Mono County was $40,839, which is 19.6 percent higher than the average annual wage for all employed persons in the County (Economic Profile System-Human Dimensions Toolkit, 2012). An influx of workers with higher-than-average pay could increase the demand for rental housing and increase rental prices. This could negatively affect existing occupants of rental housing or others seeking rental housing in Mono County. However, this effect would likely be negligible due to the existing excess of available rental housing.

A4-31 The commenter indicates that the Draft EIS/EIR should identify whether the Project construction workforce would result in demand for campgrounds, and the associated effect

[1] The data presented in Housing Element Table 2-20 differ somewhat from the Census data for Mono County.

on availability of campgrounds for recreation users. As discussed in Draft EIS/EIR Section 4.15, *Population and Housing*, the number of construction workers on-site during Phase I would range from 60 to 80 workers for the proposed power plant, 40 to 60 workers for the pipeline, and 12 to 15 workers per well. During Phase II, 60 to 80 workers would be working on the power plant, 40 to 60 would be working on the pipeline, and 12 to 15 workers per well. The average workforce would range from 10 to 20 workers during low activity periods and 100 to 120 during high activity periods.

As described in Draft EIS/EIR Section 4.15.4.1, it is anticipated that approximately 134 construction workers would commute to the Project area from outside Inyo and Mono counties, and some may engage in "weekly commuting," in which they find temporary or transient housing closer to the jobsite during the workweek, typically at motels, rental units, or local campgrounds. It is expected that such workers would seek temporary housing in the Mammoth Lakes area, where both rental housing as well as a large number of hotel or motel rooms would be available. Because there is available rental housing and hotel or motel rooms for any workers commuting to the construction site from further away, and because the three campgrounds in the area do not provide showers and have restrictions on the maximum number of nights per stay, it is not likely that many workers would choose to frequently use campgrounds as a temporary lodging option. Similarly, dispersed camping in Inyo National Forest is limited to 28 nights within a 6-month period per ranger district, and not all ranger districts are within an accessible distance of the Project site, making dispersed camping an unattractive choice for some workers (USFS, 2013). Therefore, it is reasonable to assume that the number of workers relying on Mammoth Lakes area campgrounds would be minimal and would not affect the availability of campsites for recreation users in the overall Mammoth Lakes area, including the more than 150 campsites just southwest of the Proposed Action area.

Letter A5 – Responses to Comments from Lahontan Regional Water Quality Control Board

A5-1 The commenter requests that the Draft EIS/ EIR list applicable permits and activities that may be required for implementation of the Proposed Action and Alternatives. The Draft EIS/EIR discusses the relevant permits related to surface water and water quality in Section 3.19.2, *Applicable Regulations, Plans, and Policies/Management Goals*.

A5-2 The commenter requests that a full delineation of surface waters be performed, including determination of jurisdictional waters (waters of the U.S.) and waters of the State. Existing and historic surface water features, and their general characteristics, are discussed and delineated in the Draft EIS/EIR (Section 3.19.1.1, *Water Resources*; Figure 3.19-1). As analyzed in the Draft EIS/EIR, the Proposed Action and Alternatives would avoid any discharge into potentially navigable or federally jurisdictional waters (see Responses A8-2 and I3-19) and, further, would not significantly impact any existing surface water resources, including waters of the State.

A5-3 The commenter requests that the Draft EIS/EIR identify and list beneficial uses of the water resources within the Project area. Beneficial uses of relevant water resources are discussed and considered in the Draft EIS/EIR (Section 3.19.1.1, *Water Resources*, and Section 3.19.2, *Applicable Regulations, Plans, and Policies/Management Goals*). Section 3.19.1.1of the Draft EIS/EIR discusses local and regional surface water features and provides a summary of the water quality within Hot Creek, Mammoth Creek and Crowley Lake. Table 3.19.1 lists the water quality constituents identified in segments of Mammoth Creek and Lake Crowley that has led to the listing of these two water bodies on the State Water Resources 2010 Clean Water Act Section 303(d) List of Impaired Water Bodies. Section 3.19.1.2 discusses groundwater quality and its beneficial uses. Section 3.19.2 provides a summary of the Lahontan Regional Water Quality Control Board (LRWQCB) Basin Plan and its water quality objectives. Table 3.19-3 presents the beneficial uses for Mammoth Creek, Hot Creek, and Lake Crowley consistent with the LRWQCB Basin Plan. The existing impairments and beneficial uses of the water bodies in the Project area were considered in the water quality impact analysis in the Draft EIS/EIR and in the development of mitigation measures (Section 4.19).

A5-4 The commenter states that the Draft EIS/EIR must characterize existing groundwater quality and a Degradation Analysis must be performed to quantify what, if any, degradation would occur to groundwater resources. Existing groundwater resources and quality are discussed in the Draft EIS/EIR (Section 3.19.1.2, *Water Resources*, and extensively in Section 3.7, *Geothermal and Groundwater Resources*). Potential direct and indirect impacts to groundwater resources are analyzed in the Draft EIS/EIR (Section 4.7, *Geothermal and Groundwater Resources*, and Section 4.19, *Water Resources*). As discussed, geothermal fluid removed from the geothermal reservoir would be reinjected (returned) into the geothermal reservoir, which is separate from the groundwater aquifer. The Project would not inject import water into the groundwater, as indicated by this comment. The Draft EIS/EIR analysis determined that the Proposed Action and Alternatives would not significantly degrade water quality; therefore, a Degradation Analysis is not necessary.

A5-5 The commenter requests that the Draft EIS/EIR provide specific information with respect to the potential impacts to surface waters. The Draft EIS/EIR (Section 4.19, *Water Resources*) provides a detailed discussion of the potential erosion and water quality impacts on local surface water bodies that could occur as a the Proposed Action. The impact analysis is divided into separate discussions for construction, operation, and decommissioning. Each Project Design Measure (PDM) incorporated as part of the Project and Mitigation Measure prescribed as part of the Draft EIS/EIR is described and the impact analysis determines whether the PDM or mitigation measure is adequately effective to reduce the potential impact. For example construction activities could contribute to increased erosion and downstream sedimentation and could result in increased loads of sediment and construction-related water quality pollutants (oils, greases, fuels). The impact analysis then describes the various PDMs that would ensure that erosion is minimized during construction. The Draft EIS/EIR also prescribes a mitigation measure that requires

implementation of a Comprehensive Site Drainage and Runoff Management Plan, and ensures that roads would be managed for erosion and sedimentation potential.

A5-6 The commenter requests that stormwater management be considered in the environmental review process, and that design alternatives be considered that direct captured runoff away from surface waters. Stormwater processes and management issues are addressed in the Draft EIS/EIR (see Section 3.19.1, *Water Resources, Environmental Setting*, and Section 4.19.4.1, *Water Resources Direct and Indirect Impacts*).

A5-7 The commenter provides a discussion of cumulative impacts. This comment does not pertain to the adequacy or accuracy of the Draft EIS/EIR. The comment is noted.

Letter A6 – Responses to Comments from California Division of Oil, Gas, & Geothermal Development

A6-1 The California Division of Oil, Gas, and Geothermal Development has no comments on the Proposed Action as there are no plans for drilling any of the proposed wells on State or private lands. This comment is noted.

Letter A7 – Responses to Comments from Mono County Community Development Department

A7-1 Information regarding the facilities crossing private land was discussed at the initial Project kickoff meeting on May 19, 2010 with County representative Mr. Dan Lyster. The commenter is correct that Project pipeline(s) would cross APN 037-050-002. However, no Project facilities would be constructed on, or cross LADWP lands. Section 1.6.2 and 3.10.2.3 of the Draft EIS/EIR describes the permitting responsibilities of Mono County.

A7-2 The commenter stated that reference to an Energy Development Department within Mono County should be changed to the Economic Development Department.

Page 1-14 has been amended as follows:

> Activities proposed on the private lands within the ~~P~~Project area by ORNI 50, LLC are subject to the approval of a use permit by Mono County through the Mono County ~~Energy Management~~Economic Development Department and the Mono County Planning Commission.

Page 4.10-3 has been amended as follows:

> The only portion of the CD-IV Project and Alternatives that would be on private land would be proposed pipelines going across land leased by ORNI 50, LLC or owned by LADWP. Private land in the ~~P~~Project area is designated as *Resource Management* (*RM)* [ORNI 50, LLC]. Activities proposed on the private lands are subject to the approval of a use permit by Mono County through the Mono

County ~~Energy Management~~Economic Development Department and the Mono County Planning Commission. Neither the power plant site nor any wells are proposed on private lands. Approvals by the County for the CD-IV Project would include the following (MPLP, 2010):

1. Use Permit (from ~~Energy Management~~Economic Development)
2. Building permits (from the Building Division)
3. Grading Permit (from Public Works)

A7-3 The commenter states that Figure 1-3 does not clearly depict where there may or may not be three pipelines parallel to each other. To provide clarification, the CD-IV Project does not propose 3 parallel pipes on private property. The proposed double pipeline splits off and heads north on the private property while the existing pipeline continues east.

A7-4 The commenter requests that the distance between any new proposed paralleling pipelines be indicated to assure there is safe passage for wildlife. The distance between parallel pipelines is identified in Section 2.2.5.1 of the Draft EIS/EIR (*Geothermal Pipeline Design*); the injection pipeline would be separated from the production pipeline by about 24 inches. Wildlife considerations related to the pipelines are discussed in Section 4.4.4.1 of the Draft EIS/EIR (pages 4.4-14 through 4.4-19).

A7-5 Comment noted. Applicable encroachment permits will be obtained for any construction- or operational-related activities that would affect County-maintained roadways.

A7-6 Comment noted. As stated in Section 4.16.2, *Project Design Measures*, no roadway or lane closures along County-maintained roadways would occur. In the event such closures are required, the County will be notified in advance and will conduct appropriate review of such roadway plans. The Draft EIS/EIR includes Mitigation Measure TRA-1 to reinforce the need to coordinate with Mono County in the event any such roadway or lane closures are required (see Section 4.16.9, *Traffic, Transportation and Circulation*).

A7-7 Comment noted. The plowing of any County-maintained roadways will be subject to approval by Mono County.

A7-8 The Draft EIS/EIR includes Mitigation Measure TRA-1 to address the need to implement a Coordinated Transportation Management Plan that will require approval by, and coordination with Mono County in the event rerouting of Sawmill Road may be required (see Section 4.16.9, *Traffic, Transportation and Circulation*).

A7-9 The comment recommends that the proposed geothermal plant and pipelines should be painted a dark earth green color as opposed to neutral colors to reduce visual effects from U.S. Highway 395.

As described on page 4.18-5 in the Draft EIS/EIR, PDM VIS-4 provides the option of painting the power plant and well pad facilities a "neutral color to blend in with the environment, using a color that was approved and used for the existing Basalt Canyon

facilities and/or another color scheme approved by the USFS." Similarly, PDM VIS-3 requires that pipeline segments in areas with a USFS visual quality objective (VQO) rating of "partial retention" in the vicinity of Sawmill Cutoff Road and in areas with a VQO of "retention" shall be painted colors that are approved by the authorized officer. Therefore, implementation of both measures would provide ORNI 50, LLC the flexibility of using colors similar to existing Basalt Canyon facilities with USFS' approval in order to reduce visual impacts.

Letter A8 – Responses to Comments from United States Environmental Protection Agency

A8-1 This comment serves as an introduction to more detailed comments which follow. Consequently, this comment lacks sufficient specific information to warrant a detailed response. See responses A8-2 through A8-7 for specific responses.

A8-2 The commenter states that it is not clear in the Draft EIS/EIR, whether or not jurisdictional waters of the U.S. would be impacted (see Responses A8-2 and I3-19). Potential impacts to federal and state jurisdictional waters are discussed in the Draft EIS/EIR (pages. 4.3-8, 4.3-11, 4.3-13, 4.3-14, and 4.3-17). As analyzed in the Draft EIS/EIR, the Proposed Action and Alternatives would avoid any direct impacts to federal or state jurisdictional waters. However, to clarify that no direct impacts to jurisdictional waters of the U.S. are expected, the following revisions have been made to the Draft EIS/EIR:

(Section 4.3, *Biological Resources – Vegetation*, Page 4.3-8 second paragraph, under Section 4.3.4.1):

> Direct impacts to potentially jurisdictional features in the study area, including jurisdictional waters of the U.S., are not expected.

(Section 4.3, *Biological Resources – Vegetation*, Page 4.3-11 fifth paragraph, under Section 4.3.4.2):

> As discussed above, direct impacts to potentially jurisdictional features in the study area, including jurisdictional waters of the U.S., are not expected.

A8-3 The commenter recommends that the Final EIS/EIR include a discussion of "pitless" or closed-loop drilling methods, in-lieu of the proposed techniques that require containment basins/sumps at each well site. The proposed containment basins/sumps, as well as the solids remaining after drilling activities, would be designed and managed to meet requirements of the Lahontan Regional Water Quality Control Board (LRWQCB), the USFS, and the BLM. The potential impacts of the proposed basins/sumps were addressed in the Draft EIS/EIR and determined to be less than significant with mitigation (see Draft EIS/EIR Section 4.19.4.1, *Water Resources*). The alternative alluded to by the commenter would not therefore mitigate any outstanding potential impacts. However, the suggested alternative would present additional environmental transportation and air quality impacts

related to the hauling and off-site disposal of drilling mud and cuttings. As such, further consideration of this alternative is not warranted.

A8-4 The commenter recommends additional measures to further reduce emissions of criteria pollutants and hazardous air pollutants. The suggested measures appear to be feasible; therefore, Mitigation Measure AQ-3 has been revised as follows to include the suggested measures, with the exception of the recommended third bullet because Mitigation Measure TRA-1 already requires the Applicant to prepare and implement a transportation management plan (see Draft EIS/EIR page 4.16-19).

> **Mitigation Measure AQ-3:** ORNI 50, LLC shall develop a fugitive dust control plan to be implemented during construction of the Proposed Action. The plan shall be submitted to the GBUAPCD for review and approval prior to the commencement of construction activities. The plan shall include, but not be limited to the following dust control measures:
>
> - All on-site unpaved roads and off-site unpaved access roads shall be effectively stabilized to control dust emissions using water or chemical stabilizer/suppressant.
> - All ground disturbance, including land clearing, grubbing, scraping, excavation, grading, and cut & fill activities shall effectively control fugitive dust emissions by utilizing application of water or by presoaking.
> - Limit traffic speed on unpaved access roads to 15 mph and post visible speed limit signs at construction site entrances.
> - Suspend excavation and grading activity when gusts produce wind speeds exceeding 20 mph.
> - Reduce land disturbance activities as much as possible so that natural, stable soil conditions remain.
> - The plan shall include provisions for monitoring fugitive dust based on the requirements of PDM AQ-1, and if the requirements identified in PDM AQ-1 are exceeded, construction activities shall cease until it can be determined that the requirements can be achieved.

A8-5 The commenter states that the EIS/EIR should consider Shady Rest Park, Shady Rest Campground, and nearby residences as sensitive receptors, and should evaluate the potential impacts on them accordingly. As disclosed on Draft EIS/EIR page 4.2-11, the EIS/EIR considers Shady Rest Campground and nearby residences to be sensitive receptors to air pollution and are evaluated accordingly. Shady Rest Park does not fit the EIS/EIR definition of a sensitive receptor to air pollution because it does not contain people that are particularly sensitive to the effects of air pollutants, such as children, the elderly, and people with illness, for any extended period of time. Park visits are for relatively short durations (e.g., up to several hours at a time), and any one person's

annual exposure at the park is minimal when considering effects of air pollution exposure. Therefore, for the purpose of defining health risk due to Project-related air pollutants, the EIS/EIR does not consider Shady Rest Park to be a sensitive receptor.

A8-6 The commenter points out a discrepancy between the air resources environmental consequences discussion and the Project description related to the length of well cleanout and flow testing. Revisions to the Draft EIS/EIR have been incorporated to acknowledge that flow testing could occur for up to 30 days (see below).

The commenter also indicates that a H_2S emissions monitoring plan should be required. As a requirement for the CD-IV Project, the GBUAPCD would issue an Authority to Construct permit for well drilling and testing that would require the applicant to demonstrate that drilling and testing would be in compliance with the GBUAPCD H_2S emissions limits and the California Ambient Air Quality Standard for H_2S through implementation of a specific H_2S Emission Abatement and Control Program. The exact terms and conditions of the Authority to Construct permit for well drilling would not be identified until after Project approval; therefore, it is appropriate for the EIS/EIR to identify binding mitigation that will be consistent with the requirements of the permit to ensure that hazardous emissions concentrations related to release of H_2S during well testing are controlled (see revisions to Draft EIS/EIR below).

Revisions have been incorporated to the second full paragraph on Draft EIS/EIR page 4.2-10 as follows.

> During well cleanout and flow testing, geothermal fluids would likely be pumped into large ~~open containers~~ tanks. H_2S may temporarily be released from the geothermal fluid for several hours to up to 30 days during these activities. The local H_2S emissions during these activities could exceed the GBUAPCD H_2S emissions standard of 2.5 kg/hr/source and could produce an objectionable "rotten egg" odor in the immediate vicinity of each well. However, these concentrations would not be expected to pose a health hazard and would not reach far beyond the vicinity of the well under normal conditions. Potential H_2S emissions resulting from these activities would be temporary at each well development site and would occur for a relatively short period of several hours to up to 30 days.
>
> Upon Project approval the GBUAPCD would issue an Authority to Construction permit for well drilling activities that would require well site monitoring of H_2S as well as development of an H_2S abatement plan should levels temporarily exceed 2.5 kg/hr. To formalize this requirement for the purposes of this NEPA/CEQA review, Mitigation Measure AQ-4 (see Section 4.2.9) is recommended.

Revisions to Air Resources Section 4.2.4.2 have been incorporated on Draft EIS/EIR page 4.2-15 as follows.

d) Expose sensitive receptors to substantial pollutant concentrations.

Given the temporary nature of CD-IV construction activities, the low levels of long-term TACs that would be generated, ~~and~~ the lack of sensitive receptors in the immediate vicinity of CD-IV Project components, and the Mitigation Measure AQ-4 requirements to conduct H_2S monitoring during well drilling and testing as well as implementation of a H_2S abatement plan if necessary, health risks to sensitive receptors would be negligible (see Section 4.2.4.1). The air quality impact of the CD-IV Project with respect to exposure of sensitive receptors to construction, operation and maintenance, and decommissioning-related emissions would be mitigated to less than significant.

e) Create objectionable odors affecting a substantial number of people.

During well cleanout and flow testing, H_2S may temporarily be released from the geothermal fluid for several hours to up to 30 days. The local H_2S emissions during these activities could produce a noticeable "rotten egg" odor (see Section 4.2.4.1). However, given the temporary nature of well cleanout and flow testing activities and the lack of sensitive receptors in the immediate vicinity of the proposed well sites, the CD-IV Project would not create odors that would affect a substantial number of people. The impact would be less than significant.

Mitigation Measure AQ-4 has been added to Draft EIS/EIR page 4.2-20 as follows.

Mitigation Measure AQ-4: ORNI 50, LLC shall monitor H_2S concentrations during all well drilling and testing at GBUAPCD-approved locations for each well location. If the well H_2S emissions exceed 2.5 kg/hr or the State's H_2S ambient air quality standard for one hour is exceeded, further venting will be curtailed until an H_2S abatement plan, approved by the GBUAPCD, is implemented to reduce H_2S well emissions below 2.5 kg/hr and the ambient concentrations below the State standard of 0.03 parts per million. The plan shall include (1) a description of the abatement technology, the degree of control expected from such technology, and the test data indicating that such degree of control can be expected in a geothermal well application; and (2) air quality analysis showing that the use of such abatement technology will not result in any violation of the State ambient air quality standard for H_2S.

A8-7 The commenter states that there is not a discussion regarding potential impacts to migratory birds from the installation of the new power line. Impacts to migratory birds from the new power line will be avoided and minimized because the Project design will adhere to the most recent Avian Powerline Interaction Committee (APLIC) guidelines (ORNI 50, LLC, 2013) (Section 2.2, pages 2-4). However, to reiterate that the CD-IV Project will comply with APLIC guidance, the following mitigation measure has been added to the Final EIS/EIR, Section 4.4, *Biological Resources – Wildlife*:

Mitigation Measure WIL-9: Conform to Avian Power Line Interaction Committee Guidelines. Electric distribution poles or towers being modified or integrated with the Project shall be compliant with guidelines defined by the Avian Power Line Interaction Committee (APLIC).

Letter A9 – Responses to Comments from California Department of Fish and Game

A9-1 The commenter recommends that the Draft EIS/EIR be revised and re-circulated for public comment and review due to perceived deficiencies in the analysis of biological resources. The Draft EIS/EIR provides a robust analysis of the potential impacts of the Proposed Action on biological resources and identifies mitigation measures to reduce those impacts. Additional analysis and mitigation measures have been included in response to public comments in the Final EIS/EIR. While the comment suggests that the biological resources analysis in the Draft EIS/EIR is inadequate, it provides no specific examples as a basis for the allegation. Accordingly, the agencies are unable to provide a more detailed response and re-circulation is not necessary. See Common Response 2, Recirculation, in Section 6.4.3 for more information.

A9-2 The commenter states that the Final EIS/EIR should include an analysis of expected changes in the hatchery springs on Owens tui chub growth, reproduction and habitat. Potential impacts to Owens tui chub from operation of the Proposed Action and Alternatives are discussed and considered in the Draft EIS/EIR (pages 4.4-8, 4.4-13, 4.4-14, and 4.4-19). As analyzed in the Draft EIS/EIR, the Proposed Action and Alternatives would avoid any direct impacts to Owens tui chub habitat. The Draft EIS/EIR explains that there is no Owens tui chub habitat in the Project area and that potential impacts to Owens tui chub habitat is limited to possible changes that could occur to springs which support the tui chub critical habitat near the Hot Creek Fish Hatchery and Little Hot Creek. As explained in the Draft EIS/EIR (pages 4.4-13 and 4.7-7), potential changes to the flow and temperature of the springs are anticipated to be minimal. As the commenter notes, the CD-IV Project is forecast to reduce the thermal outflow to Hatchery Springs by about 17 percent. LVHAC monitoring and analysis has shown that thermal fluid outflow contributes less than 5 percent of the total flow into Fish Hatchery Springs. The numeric model predicts that the thermal outflow may be reduced by about 17 percent, which would reduce the thermal contribution to around 4 percent of the total flow. The resulting change in the overall total flow (of thermal water and cold waters) to Fish Hatchery Springs would beapproximately 0.85 percent. The potential change in flow is not likely to be measureable relative to climatic effects (also see Response I14-22). In addition, conductive buffering of the temperature would minimize potential temperature changes making such changes difficult to detect. As such, the Proposed Action and Alternatives are not expected to result in adverse impacts to Owens tui chub or its habitat. In addition, PDM GEO-5 commits the applicant to operations and monitoring programs designed to prevent, or mitigate, potential hydrothermal impacts to the Owens tui chub critical habitat, Hot Creek Hatchery and Hot Creek Gorge springs from geothermal operations conducted on federal leases in the Mono-

Long Valley KGRA (see Section 4.7.2, *Project Design Measures*). However, to clarify that impacts to Owens tui chub and its habitat are not expected from operation of the Proposed Action and Alternatives, the following revisions have been made to the Draft EIS/EIR Section 4.3, *Biological Resources – Vegetation*, page 4.4-14, first paragraph, under Section 4.4.4.1:

> Based on this assessment ~~there would be limited potential for~~ adverse impacts on the Owens tui chub or its critical habitat are not expected as a result of operation of the Proposed Action.

A9-3 The comment states that Mitigation Measure GEO-5 is not defined in the Draft EIS/EIR. Measure GEO-5 is a Project Design Measure (PDM) for Environmental Protection proposed by the Applicant. All PDMs for the Proposed Action are described in Section 2.2.9. PDM GEO-5 is also described in Draft EIS/EIR Section 4.8.2. It requires Project construction to comply with Seismic Zone D standards of the International Building Code (IBC) and California Building Code (CBC), as adopted by the Mono County. Seismic Zone D standards are the most stringent under the CBC and are intended to address ground shaking expected under the maximum credible earthquake in the Project area.

A9-4 The commenter requests that the Draft EIS/EIR include a thorough discussion of the cumulative effects of all geothermal operations in the Project vicinity, including effects on spring flow, temperature, water quality, and Owens tui chub and their habitat. The Draft EIS/EIR evaluates the potential cumulative impact of the CD-IV Project in concert with other past (existing) (MP-1, MP-2, and PLES-1) and proposed (MP-1 replacement) geothermal power plants and facilities within the Casa Diablo complex (pages 4.7-15 through 4.7-17). There are no other presently-proposed geothermal power plants or facilities in the Project vicinity. As explained in the Draft EIS/EIR, the combined impact of operation and maintenance of the CD-IV Project and the Casa Diablo geothermal developments is unlikely to cause an adverse cumulative effect with respect to geothermal and groundwater resources. Because the Proposed Action and Alternatives are not expected to result in any direct or indirect adverse impacts to Owens tui chub or its habitat (see Response A9-2), the CD-IV Project could not cause or contribute to any cumulative impact to this species. Accordingly, Owens tui chub is not discussed under the biological resources cumulative impacts discussion.

Letter A10 – Responses to Comments from Mammoth Community Water District (MCWD)

A10-1 The MCWD comments dated February 20, 2013 are included in the Final EIS/EIR. See Responses A10-95 to A10-140.

A10-2 See Common Response 5, Groundwater Resources in Section 6.4.3.

A10-3 The Draft EIS/EIR and Common Response 5, Groundwater Resources discuss the MCWD and its annual monitoring program. The comment incorrectly states that the CD-IV Project

will increase the extraction and reinjection of a large volume of geothermal brine "from the deep layers of the Mammoth Groundwater Basin." The CD-IV Project will produce geothermal fluid from the geothermal reservoir, which is separate from the Mammoth Groundwater Basin and hosted more than 1000 feet below the MCWD wells in different aquifer rocks. The hydraulic head of the two aquifers is different, and is one of the lines of evidence of hydraulic separation between the aquifers. Historic monitoring indicates that shallow groundwater displays little response to geothermal production. See Common Response 5, Groundwater Resources in Section 6.4.3.

A10-4 The hydrogeologic setting, or conceptual model, is included in the numeric model, much as it is for the MCWD groundwater model. The validity and scientific appropriateness of the hydrogeologic setting of the conceptual model is fully presented in the Draft EIS/EIR and Appendix D. The MCWD groundwater model report (Wildermuth, 2009) states "Local geothermal extraction and injection operations related to existing and potential expanded future operations were not modeled as part of this study as existing publicly available studies and data do not indicate significant interaction between the upper cold water aquifer and the much deeper geothermal reservoir." As discussed in the Draft EIS/EIR, the model predicts the overall temperature and pressure response of the Basalt Canyon geothermal reservoir. Because this reservoir is measurably interconnected with the hydrologic features to the southeast of the caldera, corresponding flow and temperature declines in these features, e.g., Hot Creek Fish Hatchery Springs, were calculated in the Draft EIS/EIR. Flow and temperature changes for groundwater resources in the Mammoth Groundwater Basin were not calculated using model predictions of reservoir pressure and temperature, because historic monitoring provides no indication that the shallow groundwater responds to geothermal reservoir pressure and temperature changes. Disclosure of proprietary information on numeric model assumptions, calibrations, and simulations, as requested by MCWD, would not provide additional insight on the separation between the groundwater aquifer and the geothermal reservoir.

A10-5 See Common Response 5, Groundwater Resources in Section 6.4.3, which includes an additional cross-section that provides further support to the data presented in the Draft EIS/EIR and Appendix D describing a separation between the groundwater aquifer and the geothermal reservoir.

A10-6 Refer to Common Response 5, Groundwater Resources in Section 6.4.3 and Response A10-4.

A10-7 Refer to Common Response 5, Groundwater Resources in Section 6.4.3 and Responses A10-65 and A10-96.

A10-8 Refer to Common Response 5, Groundwater Resources in Section 6.4.3.

A10-9 The commenter requests that the background and Project overview indicate which entity, if any, will be utilizing the power to be generated by the CD-IV Project for its state-

mandated renewable portfolio standard (RPS) targets. The commenter is referred to Response A10-14.

A10-10 See Common Response 1, Decommissioning in Section 6.4.3.

A10-11 The commenter questions the parasitic load of 22 percent, with proportional reductions in GHG emissions relative to the quantity and use of the geothermal resource to meet the net production target of 33 MW. The parasitic load estimate of 22 percent represents a reasonable, worst case scenario. The commenter is correct that the estimate depends on numerous factors, including the pumping depths of the production wells and injection pressures for reinjection wells.

A10-12 The commenter questions the need for up to 18 potential well sites. The comment incorrectly assumes development and testing at all sites. As described in Draft EIS/EIR Section 2.2.6, well development would only continue until enough production and injection wells have been developed to provide a net 33 MW of power. The maximum number of wells potentially developed is 16 and includes both production and injection wells.

A10-13 See Response I14-63

A10-14 The commenter states that the Draft EIS/EIR should list the assumptions behind the Project's stated benefit of displacing over 89,000 metric tons of CO_2e per year for the 30-year life of the Project. As stated on Draft EIS/EIR page 4.5-4, the CD-IV Project would have a net output of 33 MW and would run continuously, potentially generating over 288,000 MWh annually. An emission factor from The Climate Registry (TCR) for the Western Electricity Coordinating Council's California electrical grid region was used to estimate the displaced indirect emissions that would be associated with the CD-IV Project (see Draft EIS/EIR Appendix C, page C-26). The emission factor uses data originating from the Emissions & Generation Resource Integrated Database (eGRID), which is a comprehensive source of data on the environmental characteristics of almost all electric power generated in the U.S. Therefore, the estimate that the CD-IV Project would displace over 89,000 metric tons of CO_2e per year for the 30-year life of the Project takes into consideration the composition of electricity generated from renewable and nonrenewable sources in California.

The commenter also indicated that the Draft EIS/EIR should consider the potential for changes to the geothermal reservoir. The following revisions have been made to Section 4.5.4.2, *Climate Change Effects on the Project*, on Draft EIS/EIR page 4.5-8:

> In addition to global warming, climate change also is expected to result in a suite of additional potential changes that could affect the natural environment, including hydrologic resources (e.g., sea level rise and flooding), water resource availability, and impacts to biological resources. However, <u>with possible exception of changes to the snowpack and the snowmelt period,</u> given the nature

and location of the CD-IV Project, the additional effects of climate change would not be expected to be relevant to the CD-IV Project.

Changes in snowpack and the snowmelt period are anticipated in California as a result of climate change (DWR, 2008, 2011). Specifically, climate change is expected to result in generally warmer temperatures, which in turn would result in a greater proportion of total annual precipitation falling as rain. Snowpack in California and the watersheds of the eastern Sierra Nevada serves as a temporary means of water storage, wherein water is released slowly and into the early summer during snowmelt. If a greater proportion of precipitation falls as rain, the snowpack would be reduced, and the potential for water storage within the snowpack would also be reduced.

Snow melt from the surrounding Sierra Nevada is the principal source of surface water runoff that recharges both the shallow cold groundwater system and deep geothermal system in Long Valley Caldera. In the event that climate change results in reduced snowpack within the Sierra Nevada, some degree of associated reduction in groundwater recharge of the geothermal system could occur. Although it is currently not possible to determine what effect reduced groundwater recharge would have on the geothermal system, this situation would not result in increased geothermal water requirements by the CD-IV Project, and would not result in additional geothermal water pumping during Project operations. Therefore, even with potential reductions in total groundwater recharge volume of the geothermal system associated with future climate change, no increase in geothermal fluid pumping would be required as a result of the effects of climate change.

A10-15 See Common Response 1, Decommissioning in Section 6.4.3.

A10-16 See Response I14-63.

A10-17 See Response I14-63 for a discussion regarding the range of alternatives. Additionally, the applicant was consulted as to whether there is potential for expansion to a larger facility (for example 60 MW facility). ORNI 50, LLC responded that they have applied for permitting a 33net MW project based on the resource and commercial viability (ORNI 50, LLC, 2013).

A10-18 See Response I14-63 for a discussion regarding the range of alternatives. The commenter suggests modifying Alternative 3 to include replacement of the existing pipeline with a larger one and sharing the production resource between the proposed CD IV power plant and existing power plants. The CD IV Project is an independent project which requires its own permitting, power purchase agreement and independent operation. See Response I9-6 for additional discussion regarding "connected actions". Regarding development of an alternative that phases development from the southeast to the northwest, well development priority will be based on the resource and geology information available to the applicant

based on their exploration activities. Forcing development from southeast to northwest could result in the development of less productive wells first resulting in the need to develop and connect more wells than may be required by a resource data based priority approach. Based on the available data, Ormat predicts the first five wells to be drilled if the Project is approved to be 12A-31, 23-31, 26-30, 55-32, and 65-25, not necessarily in that order (ORNI 50, LLC, 2013).

A10-19 The commenter asserts that the Project construction and phasing description in Section 2.2.2 is inadequate. Section 2.2.6 of the Draft EIS/EIR provided additional details regarding the Project phasing used to support the analysis and impact conclusions.

A10-20 The commenter suggests that additional information related to the need to analyze 18 potential well sites implies uncertainties regarding geothermal reservoir behavior and the conclusions regarding the potential impacts on the groundwater aquifer. The Draft EIS/EIR was prepared in response to the ORNI 50, LLC application to develop the Casa Diablo IV Project which includes up to 16 wells at 18 possible well sites. The Draft EIS/EIR describes in Section 2.2, that the total number of wells would be dependent upon well testing results. The uncertainty regarding the number of geothermal wells needed to produce 42.4 MW is entirely unrelated to Draft EIS/EIR impact conclusions on groundwater resources. As discussed in the Common Response 5, Groundwater Resources, in Section 6.4.3, the impact conclusions are based on a separation of the groundwater and geothermal aquifers that is supported by geologic, geochemical and hydrologic data.

A10-21 The comment requests further descriptions of well development. The Draft EIS/EIR adequately describes the well development process to allow for sufficient analysis of surface and hydrologic impacts. Refer to Common Response 4, Hydrologic Monitoring in Section 6.4.3.

A10-22 As described in Section 2.2 of the Draft EIS/EIR the number of wells ultimately developed will be dependent upon the results of testing. As such, the Draft EIS/EIR used a conservative approach assuming full development of all 16 wells in order to capture all possible impacts related to surface development. The commenter asserts that the Draft EIS/EIR does not take into account the hazards related to the geothermal pipeline. These potential hazards were considered on page 4.13-7 of the Draft EIS/EIR analysis.

A10-23 The commenter states that the PDMs described in Section 2.2.9 of the Draft EIS/EIR are inadequate to protect the geothermal resource. PDMs are project design measures for environmental protection proposed by the applicant. Mitigation Measures are compliance measures identified through the EIS/EIR analysis that will be required by the agencies. In addition, while no significant impacts to groundwater resources requiring mitigation measures were identified through the EIS/EIR analysis, the BLM would attach Conditions of Approval to the geothermal use permit, as done for the existing geothermal developments, that would compliance with the LVHAC monitoring program and any

recommended additional monitoring, if needed, in order to monitor conditions in the groundwater aquifer. See Common Response 4, Hydrologic Monitoring in Section 6.4.3.

A10-24 See Common Response 4, Hydrologic Monitoring in Section 6.4.3.

A10-25 As described in Response A10-14, the effects of future climate change would not be expected to result in an increase in geothermal fluid pumping associated with the CD-IV Project. Therefore, a need for additional mitigation measures related to potential lower geothermal fluid recharge associated with climate change has not been identified.

A10-26 See Common Response 4, Hydrologic Monitoring in Section 6.4.3.

A10-27 NEPA and CEQA provide specific guidance about what to include in the scope of the No Action Alternative. The No Action Alternative pursuant to NEPA assumes that the BLM denies the application for the Project. CEQA Section 15126.6, *Consideration and Discussion of Alternatives to the Proposed Project*, states that the No Project Alternative "shall discuss the existing conditions at the time the notice of preparation is published … as well as what would be reasonably expected to occur in the foreseeable future if the project were not approved, based on current plans and consistent with available infrastructure and community services." As a result, the No Action Alternative includes all previously approved wells as part of the existing baseline given that they could be drilled for exploration at any time without additional approval from the BLM or USFS. If the BLM chooses to deny the application to construct the Casa Diablo IV Project, that decision would not preclude the development of the previously approved exploration or the submittal of a future application to develop the geothermal resources. As such, exploration could reasonably be assumed to continue. Including these potential wells in the No Project Alternative presents a much more realistic baseline scenario against which to compare the Proposed Action and complies with direction pursuant to NEPA and CEQA.

A10-28 See Response A10-50.

A10-29 Geochemical analyses are one of the four lines of evidence supporting the conclusion of a separation between the groundwater and geothermal aquifers in the western part of the Long Valley caldera (see Common Response 5, Groundwater Resources in Section 6.4.3). The vertical flow of cool groundwater into the lower geothermal reservoir would be detected by changes in the chemistry, temperature and pressure of the geothermal reservoir. These changes have not been observed, supporting the conclusion that there is no vertical connectivity between the Mammoth Groundwater Basin and the geothermal reservoir in the western part of the caldera. No pressure response was observed in LVHAC groundwater monitoring points in the groundwater basin following startup of Basalt Canyon pumping. The pressure response observed in the shallow wells six miles east of Casa Diablo does not signify that such pressure changes would be also result in the Mammoth Groundwater Basin, situated in the western part of the caldera, as these two areas are physically separate and distinct in terms of stratigraphy.

A10-30 The separation is based on the known geology and the characteristic of the isolating stratigraphic intervals where penetrated. The wells used to substantiate the conclusion that the aquifers are separated are the same data points used in the Mammoth Basin Groundwater Modeling Report (Wildermuth, 2009) with additional data from USGS maps and cross-sections referenced in the Draft EIS/EIR, Appendix D, and publicly available data from more recent wells. Projecting the known stratigraphy of the Early Rhyolite separation horizon is the same extrapolation used in the Mammoth Basin Groundwater Modeling Report. Subsequent well drilling has continued to confirm the contact zones between post-collapse eruptive units (less than 500,000 years old) and indicate that the deeper Bishop Tuff, and much of the nature and extent of Early Rhyolite units, are unique time-stratigraphic horizons that can be extrapolated with some confidence. Further, the MLGRAP-1 and 2, OH Well-1, and BC 12-31 temperature gradient hole were core drilled, which facilitates the accurate collection of information such as to the depth of lithologic units, clay content or impermeable horizons. Core drilling precludes the ambiguity inherent in rotary drilling because the core can be extracted and logged whereas the logging lithologies in rotary borings relies on identification of cuttings as they are brought to the surface by air or drilling muds. Urban and Diment (1990) also included natural gamma logs that document the clay content and thickness of impermeable clay horizons in MLGRAP 1 and 2. As noted in the comment and in the Mammoth Basin Groundwater Modeling Report, the shallow cold groundwater aquifer is variable and complex but as geophysical data suggest and numerous deeper holes have shown, the intracaldera Bishop Tuff and Early Rhyolite eruptive units can be extrapolated across the caldera with the same confidence that they were extrapolated in preparing the groundwater model.

Projecting chemistry variation is subject to a number of variables; however, the chemistry of caldera surface manifestations and geothermal fluids has remained comparatively stable and are anticipated to remain stable given the continuity of the established injection/production scheme of returning 100 percent of the produced fluid to the injection reservoir.

See also Responses A10-59 and Common Response 5, Groundwater Resources in Section 6.4.3.

A10-31 See Common Response 5, Groundwater Resources in Section 6.4.3

A10-32 The numeric model developed for the CD-IV Project required a substantial effort to create and validate. As discussed in the Draft EIS/EIR Section 4.7.4.1, the model and its data are proprietary. Integration with the MCWD groundwater model, although this may be desired by the MCWD, was not necessary for forecasting the impacts of the CD-IV Project, particularly as the MCWD groundwater model (Wildermuth, 2009) and the conceptual geothermal model (EGS, 2012) agree that the two aquifers are separate.

Refer also to the Common Response 5, Groundwater Resources in Section 6.4.3.

A10-33 The new CD-IV plant would be more efficient and production temperatures of Basalt Canyon wells are higher. The net result is less fluid produced for equivalent MW power. As discussed in the Draft EIS/EIR, it is not expected that 18 well sites will be required to achieve the desired production capacity; wells will be developed until the capacity is reached. Conservatively, the Draft EIS/EIR analyses all potential well site impacts by assuming that all will be developed.

Refer to Response A10-65.

A10-34 The geologic conceptual model for the numeric modeling contains representative data and information included in the MCWD groundwater model. The analysis of potential impacts of the CD-IV Project operation does not rely solely on the numeric model, but on the separation of the groundwater and geothermal aquifers as discussed in Common Response 5, Groundwater Resources in Section 6.4.3. See also Responses A10-4, A10-69, A10-132 and A10-133.

A10-35 See Common Response 4, Hydrologic Monitoring in Section 6.4.3 regarding monitoring and Common Response 5, Groundwater Resources in Section 6.4.3 regarding the lack of vertical connectivity.

A10-36 The Draft EIS/EIR and Appendix D contains an adequate and accurate compilation of the relevant data and information regarding groundwater and geothermal resources to enable decision makers to make an informed decision regarding the potential impact of the CD-IV Project on groundwater resources under the applicable requirements of NEPA and CEQA. The data reviewed and summarized include subsurface geologic information based on proprietary and non-proprietary borehole data, results of hydrologic monitoring and groundwater monitoring, geothermal numeric model description, results of peer review of the numeric model, and model forecasts of future reservoir response. Borehole data, where publicly available, are presented in the cross-sections and lithologic columns. (Complete borehole logs for the geothermal wells and test holes are available from DOGGR; well records are proprietary information for a minimum of seven years). Proprietary geothermal production and injection well histories are routinely evaluated by the LVHAC thermal subcommittee; these findings are summarized. Time histories of geothermal production, injection, temperature, and reservoir pressure are proprietary data. The conceptual, hydrogeologic model of the geothermal system and representative cross-sections are described. The numeric model was peer reviewed and described sufficiently for its intended purpose in forecasting the geothermal reservoir response to the proposed production and injection program. The numeric model, input and output files, water budget time histories and pressure head maps for the calibration and projection simulations for the geothermal model are proprietary data.

MCWD requests for detailed information on the reservoir model convey a misunderstanding of the model's use and output. The reservoir model is used by the developer to understand and predict the geothermal reservoir response to proposed production and injection scenarios. LVHAC and MCWD monitoring results show a lack of

pressure response or drawdown in groundwater levels related to geothermal production. Because there is no known hydrologic connection of the geothermal reservoir to the overlying groundwater aquifer in Basalt Canyon, there is no forecast drawdown in groundwater levels as a response to predicted pressure and temperature changes in the geothermal reservoir. Because the hydrologic connection of the geothermal reservoir to hydrologic features located at lower elevations to the southeast of the caldera (e.g., Hot Creek Fish Hatchery springs) has been well documented, changes in flow and temperature in these features can be calculated from the model's forecast for pressure and temperature changes in the geothermal reservoir.

A10-37 The reference has been provided to the MCWD for review.

A10-38 The Draft EIS/EIR and Appendix D summarize the voluminous technical studies that were reviewed to provide the "hard data" on which the impact conclusions are based. Only proprietary information in the possession of the Agencies was withheld. The applicant's reservoir simulation model, production and injection well histories, and borehole data are discussed to the extent relevant to the analysis as required by NEPA and CEQA. However, but the BLM and the USFS have an affirmative obligation to limit the disclosure of the underlying data which has been identified as proprietary. Title 5 of the U. S. Code Section 552 (b) specifically exempts disclosure of trade secrets and commercial or financial information from a person and privileged or confidential, and geological and geophysical information and data concerning wells.

A10-39 Since receiving the MCWD's comment letter, the lead agencies have provided MCWD with additional technical information; however, as noted above, some of the information requested is proprietary and confidential. See Response A10-38.

A10-40 The MCWD alleges that the Draft EIS/EIR fails to provide critical information necessary to form proper conclusions and as a result is legally deficient. The lead agencies believe that an exhaustive review of background information was performed for the Project and summarized in the Draft EIS/EIR and Appendix D; the Draft EIS/EIR adequately and accurately evaluates potential impacts on groundwater resources and satisfies the applicable requirements under NEPA and CEQA.

A10-41 Commenter's experience is noted.

A10-42 See Common Response 5, Groundwater Resources in Section 6.4.3.

A10-43 See Common Response 5, Groundwater Resources in Section 6.4.3.

A10-44 Refer to Response A10-65, A10-92, and A10-96.

A10-45 The commenter's concerns regarding CDOGGR's oversight in the San Joaquin Valley are irrelevant to the CD-IV Project. Geothermal well drilling, completion and production for the CD-IV would be subject to BLM regulations and oversight. The approved programs for

geothermal well installation include multiple strings of cemented casing expressly to isolate produced geothermal fluids from any surrounding influence. Any cold water input would be detrimental to the productivity of a geothermal well; consequently, it is in the developer's best interest to assure that the well is completed to avoid any contact between the produced fluid and colder waters.

This and similar comments use the water well term "annular seal," as a mechanism to seal the bottom portion of the casing and allow production from an isolated portion of an aquifer. Geothermal wells are completed entirely differently. As noted above, multiple strings of cemented casing are used expressly to isolate produced geothermal fluids from the influence of any shallower cold water. BLM geothermal regulations require each string to be cemented completely to the surface to assure well integrity and isolation. Well seal installations are carefully designed and executed specifically to generate a total seal without any void spaces in the annulus between casing and formation or between casing strings. A geothermal developer complies with rigorous well installation requirements because any void behind casing would expand and damage the casing once 150-200°C geothermal fluid is flowing up the wellbore. Geothermal drilling engineering is purposely directed at completing a usable production or injection well with no external influences over the entire life of a project.

Please refer to Common Response 5, Groundwater Resources in Section 6.4.3 regarding the comment on LVHAC monitoring.

A10-46 Draft EIS/EIR Sections 3.19 and 4.19 address surface water hydrology and potential effects of above-ground project operations on surface water bodies and shallow groundwater. Draft EIS/EIR Sections 3.7 and 4.7 address the potential effects of geothermal reservoir development on related surface water (springs and surface manifestations) and groundwater resources.

A10-47 Common Response 5, Groundwater Resources contains additional mapping that addresses this comment.

A10-48 See Common Response 5, Groundwater Resources in Section 6.4.3.

A10-49 Geothermal wells must be completed in accordance with regulations that specify protection for groundwater and isolation of the produced geothermal fluid. Regulations and reservoir characteristics commonly require multiple strings of casing. Casings points are determined by the geology and hydrology of a specific area and by the competency and impermeability of the rocks units. The initial surface casing is generally set below any shallow aquifers in competent impermeable rocks. All subsequent casing strings are selected to place the casing shoe in competent, indurated and impermeable rock to assure complete cement returns to the surface and complete isolation between the geothermal fluid (eventually) flowing up the wellbore and any other water bearing zones penetrated as the well advanced. All casing strings, regardless of the quantity, are cemented from the casing shoe to the surface in geothermal wells. See Response A10-45.

To avoid confusion, the Draft EIS/EIR describes the shallow groundwater resources as the "groundwater aquifer" and the deep geothermal resources as the "geothermal reservoir." "Groundwater" is used for cold, shallow waters from the groundwater aquifer, while "geothermal fluid" is used for the hot waters from the geothermal reservoir. For example, on Draft EIS/EIR page 4.7-9 states "Drilling of geothermal production and injection wells to depths of up to 2,500 feet in the geothermal reservoir would require drilling through the shallow groundwater aquifer."

A10-50 The relative thickness of the landslide block is shown on Figure 3.7-3, Appendix D, Figure 25 and Appendix D, Figure 35. See Common Response 5, Groundwater Resources in Section 6.4.3.

A10-51 See Common Response 5, Groundwater Resources in Section 6.4.3.

A10-52 The Draft EIS/EIR page 3.7-14 states that monitoring records document no changes in the chemistry of groundwater wells in the Mammoth Groundwater Basin from 1996 to 2009 during existing production of the geothermal system. The Draft EIS/EIR page 4.7-10 states that LVHAC monitoring includes 3 shallow groundwater wells in the Mammoth Groundwater Basin and historical pressure readings at these monitored wells show little response to noticeable pressure changes within the geothermal reservoir.

The MCWD should have data from its own groundwater monitoring program to address whether drawdowns in response to geothermal operations have been observed in its wells. The MCWD has not provided any evidence to the contrary of that presented in the Draft EIS/EIR; no revisions to the Draft EIS/EIR are necessary in response to this comment.

A10-53 It is not apparent what purpose would be served by the additional figures requested by the commenter. Draft EIS/EIR Section 3.7 contains 7 figures; Appendix D contains 36 figures. The caldera margin and faulting is shown on Appendix D Figure 5; Appendix D Figure 4 illustrates the concept of upwelling of hot geothermal fluid, as also discussed on page 3.7-1. The comment does not address the adequacy or accuracy of the Draft EIS/EIR, and no revisions to the Draft EIS/EIR have been made.

A10-54 The drilling results, or rock lithologies encountered during well drilling, are described in the Draft EIS/EIR and appendices, which reference detailed well data available online through the CDOGGR website. Appendix D Figure 35 presents a conceptual cross-section of lithologic columns showing the Early Rhyolite, landslide block, and Bishop Tuff. The base of the Early Rhyolite was never penetrated by the referenced wells but the drilled thickness of the unit ranges from 400 feet in OH Well-1 to 700 feet in MLGRAP-1; roughly the thickness of the model aquifer section outlined in the Wildermuth (2009) groundwater basin model. Geologic data for resource evaluation and modeling are not limited to MLGRAP-1 and 2 and OH Well. As noted on the CDOGGR detailed maps and in the generalized well map included as Appendix D Figures 14-15 and 22-24, the geologic data include the older RDO-8 corehole that was part of the Wildermuth (2009) groundwater model of the basin and newer wells BC 12-31, 57-25 and 66-25 drilled as Basalt Canyon

production wells. At least 3 additional Basalt Canyon wells have been drilled since 2006. The locations and permit information are included in the CDOGGR website information but the completion information remains proprietary. The District's wells are referenced in Figures 11 and 18 of Appendix D. Wells deep enough to evaluate the deeper geothermal resource were used in the reservoir model. Refer also to Common Response 5, Groundwater Resources in Section 6.4.3.

A10-55 Hydraulic evidence of separation is presented in the Draft EIS/EIR Section 4.7.4.1. The distinct difference in heads is one of the important factors in concluding that the deeper geothermal system is effectively isolated from the MCWD well field. As discussed on page 4.7-11, "groundwater generally flows with topography; groundwater levels are at their highest elevations to the west, closest to Mammoth Mountain. The geothermal monitoring wells furthest west (e.g., RDO-8) also have higher water levels, but not as high as in the cold groundwater wells suggesting that there is a pressure separation between the systems, which decreases to the east (Farrar et al., 2003)." See also Figure 3 included in Common Response 5, Groundwater Resources in Section 6.4.3 which shows hydraulic heads for MCWD monitoring wells and geothermal gradient holes.

A10-56 Chemical evidence of mixing with the geothermal waters is primarily related to chloride and boron concentrations, as discussed in the Draft EIS/EIR Section 4.7.4.1. Low pH is not used as an indicator of geothermal fluids. Low pH in groundwater is typically related to the carbonate-bicarbonate reaction with carbon or hydrocarbons. Declines in pH may be attributable to volcanic activity, which has released carbon dioxide in Long Valley, as discussed in Appendix D, Section 3.6.3, *Magmatic Gases*. The decreases in pH periodically observed in some MCWD wells would not be attributable to geothermal reservoir production, as conjectured by the commenter.

Refer also to the Response A10-70 regarding temperatures of water in MCWD wells.

A10-57 As discussed in Response A10-56, while changes in pH (water chemistry) have been observed in MCWD wells, these changes are not attributable to the mixing of shallow cold groundwater and deeper geothermal fluids. In response to this comment, the following correction to the Draft EIS/EIR page 3.7-14 is made:

> Monitoring records document no changes in the chemistry of groundwater wells <u>indicative of the mixing of shallow cold groundwater and deeper geothermal fluids</u> in the Mammoth Groundwater Basin from 1996 to 2009 during continual production of the geothermal system at Casa Diablo.

A10-58 In response to this comment, the following is inserted on page 10-15 of the Draft EIS/EIR under Section 3.7, *Geothermal and Groundwater Resources*:

> <u>Sorey, 2011. *Hydrologic and Geochemical Analyses of Reservoir Fluids in the Geothermal and Groundwater Systems in the Western Part of Long Valley Caldera*. ORMAT internal report.</u>

Referenced monitoring data in Appendix D and Sorey (2011) show that the drawdown in cold groundwater from current geothermal production has been comparatively limited in a region at the extreme eastern part of the groundwater basin where, unlike the Basalt Canyon area, the geothermal water and shallow groundwater comingle.

Geothermal systems exist because they are isolated from incursions of cold groundwater. As noted in Appendix D, sharp reversals related to cold water influx at the margins of the Long Valley hydrothermal system have a very detrimental effect on geothermal well productivity, which has not been observed in the Basalt Canyon area. Downward movement of cold water is less likely in Basalt Canyon because of the physical separation between the shallow cold aquifers and the deeper geothermal system (see Common Response 5, Groundwater Resources in Section 6.4.3).

A10-59 The separation between the younger (less than 200,000 years old) late caldera fill that includes the Mammoth Groundwater Basin aquifers and the older (600,000 year old) thick Early Rhyolite units was generalized in the Draft EIS/EIR and discussed in detail in Appendix D Section 5.2. Depending on the degree of alteration and mineralization, typical of the margins and upper limits of geothermal systems, the entire section of Early Rhyolite may separate the deeper geothermal reservoir from the overlying shallow younger intracaldera fill.

A10-60 The Draft EIS/EIR and Appendix D describe the outflow zone of the deeper hydrothermal system around Shady Rest as illustrated by the isotherms in Appendix D Figure 35. There are more than three data points, as referenced in the Response A10-54. The three holes are the same data points used in the Mammoth Basin Groundwater Modeling Report (Wildermuth, 2009) to extrapolate aquifer conditions across the entire groundwater basin. Refer also to Common Response 5, Groundwater Resources in Section 6.4.3. The Draft EIS/EIR adequately evaluates potential impacts of the Project both on groundwater quality and availability, including as a result of potential downward flow of cold water to the geothermal aquifer. Refer to Response A10-114 for responses to comments regarding the downward flow of cold water near the MCWD well field.

A10-61 Refer to the Responses A10-45 and A10-49.

A10-62 Refer to the Common Response 5, Groundwater Resources in Section 6.4.3.

A10-63 Section 3.19 of the Draft EIS/EIR primarily addresses surface water resources and the potential for aboveground Project operations to affect surface water and shallow groundwater quality. More information regarding the MCWD groundwater resources is presented in Section 3.7, Section 4.7 and Appendix D including maps, cross-sections and monitoring results that extensively reference MCWD annual monitoring reports and the groundwater modeling report.

A10-64 The comment related to pH and manganese concentrations in MCWD wells is noted. The Draft EIS/EIR Section 3.19.2 discusses elevated levels of iron and manganese in MCWD

supplies. The comment does not suggest that these water quality impacts are related to the geothermal Project, and there is no available evidence to suggest that it is related (refer to Response A10-56). As no new or more severe impacts would result from these details, no revisions have been made.

A10-65 The purported influx of cold water described on page 4.7-3 was estimated based on changes in the chemistry of produced geothermal fluids which are routinely monitored. These changes may have been related to cold water incursion from the surrounding area because the Casa Diablo wells are so shallow, to the injection program at the time, and to reservoir pressure declines, which occurred during the initial stages of production. Following the detection of these changes, the production and injection regime was modified and stabilized. The proposed wells in Basalt Canyon would be at substantially greater depths than the earlier Casa Diablo wells and separated by impermeable rock layers; this barrier from cold water is an essential component of the geothermal system.

The Draft EIS/EIR and Appendix D note that in the eastern part of the caldera (closer to Casa Diablo), the geothermal system comingles with shallow groundwater in intercalated volcanic, detrital and lacustrine units. The deeper western geothermal system in Basalt Canyon is distinct from the shallow eastern portion of the system that emerges at lower elevations east of Casa Diablo. As stated in the MCWD groundwater model report (Wildermuth, 2009), the highly variable nature of the subsurface lithology and the complex stratigraphic and structural conditions result in a complex aquifer system. Generalizing an observation of subtle changes at Casa Diablo does not necessarily contradict the observation that other parts of the hydrothermal system occur under decidedly different conditions.

A10-66 As discussed in the Draft EIS/EIR Section 4.7.4.1 (page 4.7-10), LVHAC monitoring includes three shallow groundwater wells in the Mammoth Groundwater Basin. Historical pressure readings at these monitored wells show little response to noticeable pressure changes within the geothermal reservoir, such as the startup of Basalt Canyon production. Different conditions exist in the southeastern portions of caldera where geologic layers are continuous between the (shallower) Casa Diablo geothermal reservoir and surface waters. Historical monitoring has confirmed the continuity of geothermal fluid flow from Casa Diablo through Hot Creek and eastward. Measurements of pressure response to geothermal production in thermal and non-thermal wells diminishes with distance to the east of Casa Diablo. In the eastern part of the hydrothermal system (where shallow well CW-3 is located), the shallow groundwater exhibits a slight pressure response to geothermal production, but also a response to the infiltration of precipitation to the groundwater, indicating that both of these have an effect.

A10-67 Temperature declines in the geothermal reservoir predicted by the model are based on historical reservoir response, conceptual model, and projected pumping data. Temperature declines are not projected to result from cold water influx, as suggested. As previously discussed, cold water influx would be detrimental to the geothermal system.

Temperature declines of the geothermal reservoir are discussed in the Draft EIS/EIR, Section 4.7 and Appendix D.

A10-68 The discussion of the potential response of project decommissioning on hydrothermally related geothermal resources makes an analogy to the recovery of these features after the transfer of some production to Basalt Canyon in 2006, however, the CD-IV Project is projected to have less decline than was observed between 1991 and 2006 from production in Casa Diablo. Potential impacts of CD-IV Project decommissioning on cold groundwater are not discussed in detail because Project operation is not expected to cause effects on cold drinking water resources.

Casing is not discussed on page 4.7-9 as indicated by the comment. Refer to the Responses A10-45 and A10-49. Refer also to Common Response 1, Decommissioning in Section 6.4.3.

A10-69 The input for the geothermal reservoir model integrated the detailed USGS map data for the caldera, geophysics and the extensive shallow and deep drilling data across the region. The younger caldera fill (less than 200,000 yrs old) can be more stratigraphically complicated because of a mix of geologic variables over the late history of the caldera and can be difficult to extrapolate. The subsurface stratigraphy and distribution of the intracaldera Bishop Tuff and Early Rhyolite units is confirmed by deep drilling and each represents a unique time-stratigraphic horizon that can be projected over a larger areal extent within the caldera.

The MLGRAP 1 and 2, OH Well-1 and BC 12-31 gradient holes were core drilled and the stratigraphy of the wells is more accurate than the lithology determined by logging drill cutting from rotary drilled holes. The Urban and Diment (1990) reference provided for extended review included natural gamma logs that confirm the clay content and thickness of impermeable sections of the thick intracaldera Early Rhyolite in the western moat. Refer also to the Response A10-60 and Common Response 5, Groundwater Resources in Section 6.4.3.

A10-70 The quoted text on Draft EIS/EIR page 4.7-11 "suggesting a pressure separation between the systems" is supported byobserved differences in water levels in groundwater and geothermal wells which are used to indicate differences in the pressure of the aquifers encountered in those wells. The distinct water elevations (i.e., pressure separations) are shown on the cross-section and graph presented as Figure 1 and Figure 3, in Section 6.4.3 Common Response on Groundwater.

Where higher water temperatures correlate with identification of chemistry of thermal water (for example there is a linear positive relationship between temperature and thermal components such as chloride or sodium) the source of the temperature is attributed to the mixing of thermal water and non-thermal water. Where water temperatures are higher but there are no traces of geothermal fluid chemistry in the water, the source of the elevated water temperature is attributed to conductive heating of water by flowing through hot aquifer rocks. With one possible exception (Well P-17) the waters encountered in wells

along the northeastern side of the Mammoth Groundwater Basin have higher temperatures but no trace of geothermal chemistry, and thus the source of the temperature is most likely conductive heating. While it may be a concern, conductive heating in shallow aquifers on the northeastern side of the Mammoth Groundwater Basin cannot be attributed to the existing or proposed geothermal development, but rather to the underlying, natural heat of the earth that makes geothermal development possible.

A10-71 Refer to Common Response 5, Groundwater Resources in Section 6.4.3 and Response A10-64.

A10-72 Refer to Common Response 5, Groundwater Resources in Section 6.4.3.

A10-73 While additional monitored shallow non-thermal groundwater wells are present in the Mammoth Groundwater Basin, the three cited are wells with the most detailed, long-term records directly related to the LVHACmonitoring program initiated when geothermal production began.

A10-74 Appendix D references several papers that summarize past and recent effects of geothermal production on shallow cold groundwater and deeper geothermal monitoring sites. Additional reference is made to LVHAC results and long-term cooperative monitoring efforts between developers and the USGS. These results are summarized in the Draft EIS/EIR Section 4.7.4.1.

A10-75 Refer to Response A10-65.

A10-76 Refer to Common Response 5, Groundwater Resources in Section 6.4.3.

A10-77 Refer to Common Response 5, Groundwater Resources in Section 6.4.3.

A10-78 The commenter states that no explanation is provided for the lower map presented as Figure 12 of Appendix D, and that it should be presented on a larger figure. Presumably the commenter is familiar with the LVHAC monitoring program. The title of Figure 12 is USGS Hydrologic monitoring points in Long Valley. The upper map shows the types of monitoring sites and the lower map provides the name of the monitoring locations, as available online at the USGS Long Valley website.

A10-79 The comment on Figure 16 of Appendix D does not state that any new or more severe impacts would be identified by the additional monitoring points. LVHAC monitoring data is available online at the USGS.

A10-80 Correction in the title is noted. The information presented in the hydrograph figure is correct.

A10-81 Comment noted.

A10-82 Comment noted. Presenting the three on figures aptly shows the distribution at the various temperatures. The figures may be enlarged when viewing in Adobe Acrobat.

A10-83 Refer to Response A10-54.

A10-84 It is unclear what comment is meant by the attached figure showing MCWD wells, other than providing information related to the location of MCWD wells relative to geothermal wells. In response to MCWD comments, an additional figure showing the location of MCWD wells and an updated cross-section were presented in Section 6.4.3, Common Response on Groundwater.

A10-85 Commenter's experience is noted.

A10-86 Comment restates Draft EIS/EIR conclusions.

A10-87 Commenter states that monitoring data generally supports conclusions related to historical Casa Diablo Project operations but expresses concern because the proposed Project in Basalt Canyon is 1 to 2 miles closer to the MCWD well field and conjectures that there may be possible connections of groundwater and geothermal water related to faulting. Basalt Canyon production began in 2006, providing more than six years of monitoring data which has not shown effects of geothermal production on shallow groundwater resources, affirming the Draft EIS/EIR's conclusion related to potential impacts on groundwater resources. The commenter did not offer any evidence to the contrary of the Draft EIS/EIR.

Refer to Common Response 5, Groundwater Resources in Section 6.4.3 regarding the chloride detection in MCWD well 17. While some slight influence has been detected, it is not "clear evidence of a connection between the geothermal and shallow cold aquifers." As discussed in the Draft EIS/EIR Section 4.7.4.1, the bulk of the evidence indicates these two aquifers are quite separate.

Refer to Response A10-70 regarding the warmer temperatures in MCWD wells 16, 17, 18, and 20. As discussed in the Draft EIS/EIR Section 4.7.4.1, these warmer temperatures are believed to be the result of conductive heating as water flows through hot rocks.

A10-88 The geothermal reservoir model peer review report was provided for review by the MCWD and its consultants under a confidentiality agreement. Refer to Response A10-4 and A10-38.

A10-89 The comment alleges that the Draft EIS/EIR analysis of the contains "information at selected geothermal wells and springs, previously published reports and personal conversations" and few useful illustrations or tables with which to gain confidence in Draft EIS/EIR conclusions. The Draft EIS/EIR Section 3.7 contains 7 figures; Appendix D contains 36. The conclusions presented regarding potential impacts on groundwater resources are based on review of all available data, not select favorable data as the commenter implies. Figures present representative data, as it would be impractical to present figures or graphs for every monitored well in Long Valley. The lead agencies believe that an exhaustive review of background information was performed for the Project and summarized in the Draft EIS/EIR and Appendix D; the Draft EIS/EIR adequately and

accurately evaluates potential impacts on groundwater resources and satisfies the applicable requirements under NEPA and CEQA.

Additional figures prepared in response to MCWD requests provide additional support to the conclusions presented in the Draft EIS/EIR Section 4.7.4.1 regarding groundwater resources. See Common Response 5, Groundwater Resources in Section 6.4.3. Refer also to Response A10-38.

A10-90 Refer to Response A10-88.

A10-91 Refer to Response A10-38.

A10-92 As discussed in Common Response 5, Groundwater Resources in Section 6.4.3, development in Basalt Canyon is not a completely new stress. No pressure response or water level declines related to geothermal production have been observed in shallow groundwater wells since production began in Basalt Canyon in 2006. The targeted production zones in Basalt Canyon are substantially deeper than at Casa Diablo, providing a greater separation between the shallow groundwater aquifer and the deeper geothermal production zone. MCWD's concerns that geothermal production in Basalt Canyon could induce the downward flow from the cold groundwater system into the geothermal system, while understandable, are not supported by available data as presented in the Draft EIS/EIR Section 4.7.4.1. Further, the downward flow of cold groundwater would also adversely affect the geothermal system, which exists only because it is separated from cold waters. Therefore, it is not in the interest of either the MCWD or the geothermal operator for cold groundwater to enter the geothermal system.

Although there is no indication that the groundwater and geothermal systems in Basalt Canyon are connected, if they were, the downward flow of groundwater would be induced by large pressure declines in the geothermal system. Because pressure declines are detrimental to the production of energy, one of the goals of geothermal development is to manage production and injection to avoid large pressure drops, thus, also reducing the potential to induce downward flow of cold water which would cool the system. Temperature, pressure and chemistry of the geothermal fluid are continually monitored by the operator and would provide indications of mixing.

As described in Section 2.2, the actual number of new geothermal wells to be operated in Basalt Canyon would likely be less than 14, depending upon the productivity of the wells.

A10-93 Comment noted.

A10-94 Commenters' experience is noted.

A10-95 See Response A10-40; also see Common Response 5, Groundwater Resources in Section 6.4.3. The Draft EIS/EIR adequately and accurately evaluates potential impacts on groundwater resources and satisfies the applicable requirements under NEPA and CEQA.

A10-96 The MCWD experts appear to have some confusion regarding the Draft EIS/EIR's discussion of the connection between the geothermal reservoir and the shallow, related hydrothermal system that appears in outflow zones *at lower elevations to the east of Casa Diablo.* The shallow groundwater aquifer in the western portion of the caldera near the proposed Basalt Canyon development is unrelated to the shallow hydrothermal system in the east (see Response A10-65). As discussed throughout the Draft EIS/EIR and Common Response 5, Groundwater Resources in Section 6.4.3, no connection has been shown between the deep geothermal reservoir and the *overlying* shallow groundwater system in the western caldera (Basalt Canyon area).

Sorey's geochemical investigation was intended to evaluate the potential for intermixing of geothermal fluid with groundwater as a possible explanation for the elevated temperatures observed in the northwest portion of the Mammoth Basin. As discussed in the Draft EIS/EIR there was no consistent evidence for a hydrologic connection between the thermal and non-thermal water in this area, with the *possible* exception of Well 17, which could not conclusively be ruled out (although Sorey cautions that this data, which is so close to the limits of laboratory detection, may be affected by the limits of accuracy of the laboratory analytical instruments).

Evidence for the possible movement of shallow cold groundwater into the geothermal system would be detected in temperature, pressure, and chemistry of produced geothermal fluids. These parameters are routinely monitored by the geothermal producer and the LVHAC. As discussed, temperature declines at Casa Diablo (a much shallower reservoir) in the 1980s were partially attributed to an influx of cold groundwater based on geothermal fluid chemistry. As a result, geothermal production has shifted west to a deeper zone in Basalt Canyon, which provides greater separation from the cold groundwater that could quench the geothermal system.

Additional geologic and piezometric data provided in Common Response 5, Groundwater Resources in Section 6.4.3 provides additional support regarding the Draft EIS/EIR's conclusions regarding the potential impact of the CD-IV Project on the shallow groundwater aquifer utilized by MCWD.

See also Responses A10-137 through A10-140 for responses to related comments on the Basalt Canyon Pipeline project.

A10-97 Commenters' review of the confidential peer review report of the geothermal numeric model indicates a general misunderstanding of the model and expectations for the model technical review report. The report presents representative figures indicating a reasonable agreement between historic pressure monitoring and model predictions. The peer review report would not be expected to provide new information on the hydraulic separation but to confirm that the numeric model adequately represents the geologic conceptual model, which it does. The assertion that the model is not calibrated in the area of Basalt Canyon and the MCWD well field is incorrect. The model is designed to predict the response of the geothermal reservoir in Basalt Canyon (in terms of pressure and temperature) to

various production and injection scenarios. Because the geothermal reservoir is known to be hydrologically related to the hydrothermal features to the southeast, the good agreement of historic pressure histories and the model's predictions at these locations confirms the model assumptions regarding the temperature and pressure changes of the geothermal reservoir in Basalt Canyon. The model is not calibrated in the area between Basalt Canyon and the MCWD well fieldsimply because there is no known hydrogeologic connection, or pressure response to geothermal production, observed in this area.

Refer to Responses A10-101 to110 and A10-130 to 134.

A10-98 Refer to Common Response 5, Groundwater Resources in Section 6.4.3 and the Responses A10-101 to A10-136.

A10-99 Refer to Response A10-38.

A10-100 The Draft EIS/EIR, Appendix D and its references provide adequate information to support the conclusions of potential Project impacts on the cold groundwater system. The Draft EIS/EIR adequately and accurately evaluates potential impacts on groundwater resources and satisfies the applicable requirements under NEPA and CEQA.

A10-101 The location of the Long Valley Caldera, shown on Figure 1, should be familiar to the commenter. The relevant portion of the figure showing the Casa Diablo Geothermal Field is also presented as Figure 22 in Appendix D.

A10-102 The figure shown is reproduced from Appendix D. Refer to Appendix D Figure 35; boring locations are shown on Figure 15. See also Common Response 5, Groundwater Resources in Section 6.4.3 regarding separation. The comment ignores language in the Draft EIS/EIR and Appendix D that discuss that the separation consists of the entire section of 1000-2000 feet of Early Rhyolite and the landslide block. The landslide is an important element but only a part of the stratigraphy that separates the hydrothermal system from the comparatively thin coldwater aquifer section of mixed till and basalt. Common Response 5 discusses the 400,000 year age contrast, the ash-rich Early Rhyolite units in the west moat and the alteration of those units to clay to form a significant barrier that taken together exceed the collective thickness of the cold groundwater aquifer(s).

A10-103 The boring locations are shown in Appendix D, Figures 14 and 15.

A10-104 The commenter should recognize the MCWD groundwater model figure (provided by Dr. Wenbin Wang of Wildermuth Environmental, Inc.) used as a base map, upon which the caldera margin and shallow groundwater and geothermal system recharge are superimposed. The purpose of the map is to show the differing recharge areas of the geothermal system (from the west) and the shallow groundwater system (from the south). No changes were necessary as a result of this comment.

A10-105 The Draft EIS/EIR page 4.7-10 characterizes the Early Rhyolite units as "low permeability clays," "mostly impermeable clays," and "a generally impermeable barrier" between the groundwater aquifer and the underlying geothermal reservoir. Given the thickness of this layer, it is generally considered impermeable although not stated as such.

A10-106 Refer to Response A10-104.

A10-107 The Draft EIS/EIR and Appendix D note that few hot springs or fumaroles occur in the western caldera. Extensive mineralization evident in the stratigraphic records shows that the current hydrothermal system poured out at the surface, until faulting or fracturing opened older flow paths at lower elevations to the east. The cross-sections prepared for the Mammoth Groundwater Basin (Wildermuth, 2009) presented as Draft EIS/EIR Figure 3.7-6 similarly depict little to no faulting at depth. The Draft EIS/EIR, Appendix D and previous responses note that geothermal systems only exist where they are separated from the detrimental influence of cold water and they typically develop peripheral alteration and mineralization seals that isolate them from coldwater influx which would quench the system. The pervasive influence of cold water is evident from geothermal wells on the periphery of the Long Valley system and well documented in the published literature, however, the Project area is located within the resurgent dome near the center of the Long Valley caldera and away from these influences.

A10-108 Contrary to the commenter's interpretation, the italicized reference to Sorey describes the isotopic data which supports the analysis that the waters, which recharge the groundwater aquifer and geothermal system, are derived from different source areas, as shown on Figure 7. Sorey's geochemical investigation was intended to evaluate the potential for intermixing of geothermal fluid with groundwater as a possible explanation for the elevated temperatures observed in the northwest portion of the Mammoth Basin. As discussed in the Draft EIS/EIR there was no consistent evidence for a hydrologic connection between the thermal and non-thermal water in this area, with the *possible* exception of Well17, which could not conclusively be ruled out (although Sorey cautions that this data, which is so close to the limits of laboratory detection, may be affected by the limits of accuracy of the laboratory analytical instruments).

Evidence for the possible movement of shallow cold groundwater into the geothermal system would be detected in temperature, pressure, and chemistry of produced geothermal fluids. These parameters are routinely monitored by the geothermal producer and the LVHAC. As discussed, temperature declines at Casa Diablo (a much shallower reservoir) in the 1980s were partially attributed to an influx of cold groundwater based on geothermal fluid chemistry. As a result, geothermal production has shifted west to a deeper zone in Basalt Canyon, where the proposed Project is located, which provides greater separation from the cold groundwater that could quench the geothermal system.

A10-109 Refer to Common Response 5, Groundwater Resources in Section 6.4.3.

A10-110 As summarized in Common Response 5, Groundwater Resources in Section 6.4.3, the separation between the groundwater aquifer is due to several geologic factors: the Upper Early Rhyolite, the unconformity, the landslide block, and intense mineralization. See also Response A10-114.

A10-111 This statement "Taken together, the chemical, thermal, and isotopic data do not show consistent evidence for hydrologic connections between thermal and nonthermal groundwater beneath the western part of Long Valley Caldera" is interpreted by the commenter to mean that the evidence of an interconnection is inconsistent or inconclusive. The Sorey (2011) report investigates the elevated temperatures and chemistry of five MCWD wells to determine whether the elevated temperatures result from mixing with geothermal fluids. Its conclusion supports the Draft EIS/EIR discussion that there is a separation between the groundwater and geothermal systems. As discussed in Common Response 5, Groundwater Resources in Section 6.4.3, the chemical data for Well 17 is inconclusive and MCWD's reliance upon this data outlier ignores the primary conclusions of this study.

A10-112 Figure 1B illustrates LVHAC monitoring points in the south moat area. It is understood that MCWD monitors a number of supply wells and monitor wells, as shown on Figure 3.

A10-113 The commenter correctly identifies Figure 3 as a MCWD water elevation figure. This map was not referenced because the Sorey (2011) report was not intended for publication.

A10-114 The geochemistry of the thermal and non-thermal waters of Long Valley was summarized in the Draft EIS/EIR, Appendix D from references provided to the abundant publications documenting more than 40 years of geochemical evaluations in Long Valley. The comment notes *"no fluid samples were collected from the four geothermal wells drilled in the Mammoth Lakes area"* but takes this out of context or provides none of background discussed in the original report. Sorey highlighted data from temperature gradient holes MLGRAP-1, MLGRAP-2 and OH Well-1 that were drilled to evaluate potential direct use of geothermal fluids in the Town of Mammoth Lakes. The objective of completing a gradient hole is to exclude coldwater influences. While water levels were recorded during drilling and before cementing tubing in place, no water samples were collected because those samples would not be representative of water chemistry due to drilling fluid contamination.

This is not to imply that geothermal wells have never been sampled in the west moat. The USGS has repeatedly sampled RDO-8 at Shady Rest as part of the LVHAC monitoring program. The analyses are used often as a reference end member for geothermal water compositions. As shown on Table 2 (Sorey, 2011), the chemical signature of water in Well RDO-8 in terms of temperature, total dissolved, chloride concentration, fluoride concentration and bromide concentration is quite distinct from that observed in MCWD Well 17. The sampling has not shown any evidence of coldwater incursion from "downward flow."

As the comment notes, geochemical data are crucial, yet the MCWD has consistently refused to allow the USGS to sample and analyze waters from its wells as part of the LVHAC until 2011. Limited geochemical data collection constrains more detailed interpretations, but it is certainly not a "fatal flaw." Any coldwater influence or change in producing conditions would be noticed very quickly in the temperature and pressure data that are continually monitored by Ormat for the LVHAC. These data are critical because it is in the developer's interest to maintain optimal production of the hydrothermal resource, which cannot be done if cold water intrusion occurs.

A10-115 The commenter does not supply any specific information regarding water level trends in Well 17, or other MCWD wells that are closer to Well 17, to support this assertion that water level trends in SC-2 may not be applicable. Geothermal monitoring points have been established through the LVHAC and data is collected on a consistent basis. As generally observed in SC-2 and other monitored wells (see Figure 4 in Common Response 5, Groundwater Resources in Section 6.4.3), water levels in shallow groundwater tend to correlate with climatic variations.

A10-116 The Draft EIS/EIR discusses the issue of elevated temperatures observed in MCWD wells in the northwest corner of the Mammoth Basin and the data from the temperature gradient holes. Based on temperature profiles in the temperature gradient holes, Sorey speculates that these holes penetrate a somewhat separate and lower temperature thermal flow system. These data can also be explained by a higher heat gradient heating groundwater near the periphery of the caldera, as opposed to a connection between the aquifers.

A10-117 Sorey uses the term "satellite geothermal system" to describe this area of elevated water temperatures. Suemnicht (EGS, 2012) disagrees with this interpretation. Regardless, the commenter's analogy between one reported influx of cold water into the shallow geothermal system at Casa Diablo in the early 1980s with a connection between the warm waters observed in the northwest portion of the Mammoth Basin and the deeper Basalt Canyon reservoir is specious. See Response A10-65. The commenter ignores the results of data provided by daily monitoring of geothermal reservoir temperatures and pressures, chemistry of produced fluids, LVHAC monitoring, and MCWD monitoring.

A10-118 The commenter states that, contrary to the Sorey report, stable isotope data for the Lakes Basin was available in 2009 for review; however, the commenter neither provides this data nor asserts that this data is inconsistent with the findings reported in the Draft EIS/EIR; therefore, no change was made.

A10-119 As discussed in Common Response 5, Groundwater Resources in Section 6.4.3, the publications and references cited in the Draft EIS/EIR have quantitatively determined that variations in the shallow hydrologic system in Long Valley are primarily due to climatic and seasonal variations. The hydrograph for Well 26M (presented on Common Response 5, Figure 4) shows no response to Basalt Canyon startup and clearly demonstrates the effects of rainfall. The commenter's speculation about water level declines in Well 26M being related to geothermal production is contrary to his own

analysis presented in the MCWD Annual Monitoring report, which states the water level decline "was primarily due to decreased recharge during dry years" (Schmidt, 2013).

As documented in MCWD annual monitoring reports, groundwater pumping has a substantial influence on most District wells, producing drawdowns of about 10 to100 feet during heavy use or periods of drought. Basalt Canyon wells have been producing an average of 2000 gallons per minute since 2006 and the MCWD has not reported any adverse effects on groundwater wells in its monitoring reports or to the LVHAC. The primary MCWD production wells are about 3 miles west of Basalt Canyon. MCWD annual monitoring report (Schmidt, 2013) notes that the effects of the cone of depression resulting from MCWD pumping did not extend east of Well No. 19 (roughly 1 mile). Wildermuth (2009) used a similar rationale in minimizing the potential influence of District groundwater pumping on surface springs such as the Fish Hatchery. Similarly, it is arguable that the cone of depression from the Basalt Canyon geothermal wells would not extend three miles away to induce drawdown in Well 26.

A10-120 Comment regarding more recent monitoring data is noted. The commenter does not provide monitoring data or assert that more recent data would be contrary to the findings study findings. See also Common Response 5, Groundwater Resources in Section 6.4.3.

A10-121 The USGS evaluation of the MLGRAP – 1 and 2 temperature gradient holes focused on problems with producing reliable and representative temperature data not on their ability to produce water. The commenter mistakenly applies an understanding of water wells and groundwater aquifers to the construction of temperature gradient holes, geothermal wells and production schemes for geothermal resources. As discussed in Responses A10-45 and A10-49, geothermal wells are completed in accordance with CDOGGR regulations that specify protection for groundwater and isolation of the produced geothermal fluid.

A10-122 The Town of Mammoth Lakes lithologic logs for MLGRAP-1 note that the referenced tuff sections are altered to clay and note moderate to heavy clay zones (predominantly kaolinite) throughout the tuffs and as fillings between breccia clasts. The logs also note poor core recovery through 50 foot sections because of fines and altered ash. The Diment and Urban (1990) reference included natural gamma ray logs for the well that were apparently ignored. The natural gamma counts over the cited intervals were very high, indicating a high clay content. Oxygen isotope analysis of core from MLGRAP-1 reveals highly altered units over the same depth range effectively limiting permeability (Smith and Suemnicht, 1991). Wildermuth (2009) defined the effective base of the groundwater aquifer from by MLGRAP-1 data at ~1000 ft. in cross-section B-B' and constructed their groundwater model accordingly.

A10-123 See Response A10-121.

A10-124 See Common Response 5, Groundwater Resources in Section 6.4.3 regarding separation of the geothermal and groundwater aquifers. It should be pointed out that the MCWD groundwater model (Wildermuth, 2009) states "Local geothermal extraction and injection

operations related to existing and potential expanded future operations were not modeled as part of this study as existing publicly available studies and data do not indicate significant interaction between the upper cold water aquifer and the much deeper geothermal reservoir."

Many of the comments, including this summary comment, reflect a selective use of information, ignore overall data, and reflect an incomplete understanding of the geologic setting, the Long Valley geothermal system, the findings of historic monitoring, and geothermal development and operation.

The Draft EIS/EIR and Appendix D provide a summary of the extensive data accumulated in over 30 years of study on the Long Valley Caldera. No data contrary to the conclusions of the Draft EIS/EIR were withheld. Only proprietary data were withheld, as discussed in Response A10-38. The Draft EIS/EIR also includes discussion of data that are not readily explained by the conceptual geothermal model, such as a potential cold water influx that occurred in Casa Diablo in the 1980s and warm waters observed in the northwest portion of the Mammoth Groundwater Basin. The commenter repeatedly points to these two examples to assert that there is a connection between the groundwater and geothermal system, and ignores the findings of numerous studies which support the Draft EIS/EIR conclusions that there is no such connection in Basalt Canyon.

The commenter's assertions regarding that the "absence of using all of the relevant information, including that from the Gomez geothermal well and MCWD Well No. 26, and the lack of sampling results for the geothermal water in the Mammoth Lakes are demonstrate gross deficiencies in the data used for the evaluation" are patently incorrect. As shown in Common Response 5, Groundwater Resources in Section 6.4.3, the additional data regarding MCWD Well No. 26 further supports the Draft EIS/EIR impact analysis. The Draft EIS/EIR does not need to enumerate the data from each and every well completed in Long Valley to present a reasoned analysis of the potential impacts on groundwater resources. Until 2011, the MCWD has not permitted the USGS to sample its wells as part of the hydrologic monitoring program; yet the MCWD complains that there is insufficient data presented in the Draft EIS/EIR. Rather than dismissing pieces of data, the Gomez direct use well was discussed in an effort to present all of the relevant information but, as a hydrologic consultant should know, private water well data are exclusively proprietary to the driller and CDOGGR policies allow an operator to hold well records as proprietary for a minimum of seven years. Refer to Response A10-38 regarding the use of proprietary data in the Draft EIS/EIR. The Draft EIS/EIR adequately and accurately addresses potential impacts to groundwater resources and satisfies the applicable requirements under NEPA and CEQA.

A10-125 The comment restates the Draft EIS/EIR conclusion that the CD-IV Project is not expected to adversely affect the MCWD shallow groundwater resources.

A10-126 See Common Response 5, Groundwater Resources in Section 6.4.3.

A10-127 Refer to Response A10-60, A10-69, and Common Response 5 in Groundwater Resources in Section 6.4.3.

A10-128 Refer to Common Response 5, Groundwater Resources in Section 6.4.3 and Response A10-87.

A10-129 The commenter misunderstands the Sorey citation, which describes the high degree of *lateral* continuity of the deeper geothermal system and the shallow wells and springs to the southeast of the caldera, as discussed in the Draft EIS/EIR Section 4.7.4.1. This outflow to lower elevations is discussed in Response A10-96. It is not evidence suggesting the movement of shallow cold groundwater flowing into the geothermal water and the connectivity of these two systems.

A10-130 This caveat could be attached to any scientific analysis, as funding and time are common constraints to any investigation and the potential always exists for new and unforeseen issues to arise. Adequate review was performed to render professional judgment about the overall adequacy and usefulness of the model for predicting geothermal reservoir behavior.

A10-131 See Common Response 5, Groundwater Resources in Section 6.4.3 regarding hydrogeologic data supporting the conceptual model assumption of separation of the groundwater aquifer and the geothermal reservoir in Basalt Canyon, which is also an assumption in the MCWD groundwater model. The lithologies in the Basalt Canyon area are known from the geothermal exploration drilling (see Response A10-54, A10-60 and A10-69 regarding geology in the Project area). As shown on Figure 11 of the SAIC report, the numerical simulation grid covers the Basalt Canyon area and the model utilizes production history from Basalt Canyon since 2006 to calibrate the predicted reservoir response.

A10-132 The comment suggests that because the peer review report only includes figures for the calibration match for three of the five wells used, that the report is lacking data. The report includes representative data that support the peer reviewer's conclusion that there is good agreement between the model simulation and the history match. As discussed in the Draft EIS/EIR, there is a direct hydrologic connection between the deep geothermal reservoir in Basalt Canyon and the outflow zones to the southeast of Casa Diablo. The history match with these outflow zones confirms the model's predictions of the behavior of the deep geothermal reservoir it is designed to model. Additional information on calibration of the model is proprietary. Refer to Response A10-38 regarding the use of proprietary data in the Draft EIS/EIR.

A10-133 The referenced wells are only the examples of the simulation/history match; these are not the only locations of estimated impacts of the model. The model was created expressly for the purpose of evaluating the conditions within in the Bishop Tuff geothermal reservoir in Basalt Canyon and for the managing production and injection program. As discussed in the Draft EIS/EIR, the model predicts the overall temperature and pressure response of the

Basalt Canyon geothermal reservoir. Because historical monitoring has shown that the geothermal reservoir is measurably interconnected with the hydrologic features to the southeast of the caldera, model predictions of geothermal reservoir pressure and temperature declines were used to calculate corresponding flow and temperature declines in these features, for example Hot Creek Fish Hatchery Springs. Flow and temperature declines for groundwater resources in the Mammoth Groundwater Basin were not calculated using the model forecasts, as there is no indication that shallow groundwater in this aquifer responds to geothermal reservoir pressure and temperature changes.

A10-134 See Response A10-133.

A10-135 Comment restates A10-92. Refer to Response A10-92.

A10-136 Comment restates A10-93. Refer to Response A10-93.

A10-137 The comment, copied from the Basalt Canyon Geothermal Pipeline Project EIR in 2005, suggests that the Draft EIS/EIR should stress that no model is perfect, and that the model is a tool, rather than a predictor of future conditions. The discussion of the numeric model in the Draft EIS/EIR is in no way intended to indicate that the reservoir will behave exactly as predicted by the model; however, the model, based on the current understanding of the physical system and historical reservoir response, is the best available tool for conducting a reasonable evaluation of future impacts.

A10-138 The Draft EIS/EIR acknowledges a connection between the deep geothermal reservoir and the shallow groundwater system in outflow zones *to the east of Casa Diablo.* The shallow groundwater aquifer in the western portion of the caldera is unrelated to these shallow outflow zones to the east (see Response A10-65). As discussed throughout the Draft EIS/EIR and Common Response 5, Groundwater Resources in Section 6.4.3, no connection has been shown between the deep geothermal reservoir and the overlying shallow groundwater system in the western caldera (Basalt Canyon area) based on an assessment of a number of separate lines of evidence.

A10-139 Refer to Common Response 4, Geothermal Monitoring in Section 6.4.3.

A10-140 The Draft EIS/EIR Section 4.13.4.1 discusses the potential impact of a release of geothermal fluids containing hazardous materials, such as the boron and arsenic

Letter A11 – Responses to Comments from Mono County Local Agency Formation Commission (LAFC)

A11-1 The comment provides a map by Mono LAFCO to clarify the fire districts and sphere of influence boundaries in the Project vicinity. Refer to Response A3-1 in which modifications to Figure 3.10-1 have been made.

A11-2 The comment, along with the attached map, shows the boundaries and sphere of influence for the Long Valley Fire Protection District (LVFPD). This map confirms that the proposed

power plant site is located within the LVFPD boundary, as stated in Section 3.13 of the Draft EIS/EIR. The LVFPD service area extends west to the section line of R27E, which would also include a portion of the well field.

A11-3 The comment, along with the attached map, shows the boundaries and sphere of influence of the Mammoth Lakes Fire Protection District (MLFPD), located to the west of the LVFPD. A portion of the proposed well field would be located within the MLFPD boundary.

A11-4 The commenter states the Town of Mammoth Lake's Sphere of Influence share a common sphere of influence with MLFPD. No response required.

A11-5 The commenter states the Town of Mammoth Lake's Sphere of Influence should remain coterminous with the Town Boundary. No response required.

A11-6 The comment consists of a map showing local government boundaries and spheres of influence in the CD-IV Project vicinity. No response required. See also Response to Comment A3-1.

Letter I1 – Responses to Comments from John Marinkovich

I1-1 The commenter expresses support for the CD-IV Project and geothermal power in general. This comment is noted.

Letter I2 – Responses to Comments from Jo Bacon

I2-1 In response to this comment, to provide clarification, the text quoted by the commenter applies only to the No Surface Occupancy area described in Sections 1.4.2 and 3.10.1, which summarizes how activities in the restricted occupancy area are handled in the Draft EIS/EIR. The CD-IV Project components affected by these stipulations include pipelines and wells in the vicinity of wells 12A-31, 23-31, 35-31, 81-36, 14-25 and 15-25, as shown on Figure 1-2 (Restricted Surface Occupancy Area). Potential impacts associated with the applicable resources have been analyzed in the Draft EIS/EIR in Sections 4.18 (Visual *Resources*), 4.14 (*Recreation*) 4.3 (*Biological Resources- Vegetation*), and 4.4 (*Biological Resources-Wildlife*).

I2-2 The commenter indicates that the Draft EIS/EIR assumes all recreation activities occur along designated trails. See Response A4-7 and A4-9, and changes to text that more clearly identify cross country uses and effects on those uses as a result of the Proposed Action.

I2-3 The commenter indicates that multiple parallel pipelines results in additional obstacles and barriers. See Response A4-11.

I2-4 The commenter indicates that the Draft EIS/EIR does not include an estimate of acres lost to recreation due to the proposed pipeline. As described in Chapter 2, Alternatives, an estimated 5.58 miles (8.98 km) of existing roads would be improved to provide access to the well field. Approximately, 0.61 mile of unauthorized roads would be added to the NFSR to be used as access roads. An estimated 0.77 miles (1.24 km) of new permanent access roads would be constructed from existing roads to the well sites where proposed well pads are not immediately adjacent to existing roads. The exact length of production and injection pipelines would depend upon which production and injection wells would ultimately be developed; however, ORNI 50, LLC estimates that the alignment would total approximately 5.7 miles (9.2 km), of which up to 3.5 miles (5.6 km) could consist of double pipeline (two pipelines aligned parallel to each other). The total length of pipeline would be approximately 9.2 miles (14.8 km). As discussed on Draft EIS/EIR page 4.14-7, proposed well pipelines include a route that would run parallel to Sawmill Road (03S25), which serves as a popular recreation road and intersects with several other roads that serve recreational uses, particularly in the winter. Further, there are other locations where pipelines would cross NFSRs that provide recreation opportunities. During winter months, these roads are often used for snowmobiling and cross country skiing. The concentration of pipelines (including existing pipelines) and well facilities near Shady Rest Park and the existing OSV staging area could result in confusion and safety hazards as OSV and other recreation users attempt to cross the Project area from the staging area to areas to the northwest commonly used for open riding. Further, the siting of pipelines would affect cross country recreation opportunities.

I2-5 The commenter indicates that there is no analysis of the effect of deer passage on recreation shown in Figure 4.4-5. Additional underground and aboveground pipeline segments sufficient to allow deer to pass under would provide additional locations where recreation users could cross the pipelines, in addition to the road crossing locations included as part of the Proposed Action.

In response to this comment, Mitigation Measure WIL-5 has been revised:

> **Mitigation Measure WIL-5:** The proposed pipelines running parallel to the existing Basalt Canyon pipeline shall be installed underground in alignment with the existing underground sections in order to provide a clear visual corridor for migrating deer. The underground sections shall be a minimum of 30 feet in length. In most cases these segments occur at existing roads, which mule deer habitually use for movement. Segments that are parallel to the existing Basalt Canyon pipeline in areas where there are currently no underground segments shall be installed underground at a prescribed frequency. These underground segments shall be located in alignment with suspected traditional migratory routes (see Figure 4.4-1). At this time, constructing underground segments in the existing Basalt Canyon pipeline is not proposed, as deer readily pass over the single pipeline. In addition to these underground segments, overhead pipeline segments shall be installed at high movement areas identified to the immediate

south of Highway 395 and between well pad sites 57-25 and 66-25 (see Figure 4.4-5). These overhead segments shall be of sufficient height to allow wildlife and people (or vehicles) to pass under the pipeline. It should be noted that these proposed migratory crossing requirements should be viewed primarily as conceptual and should be used to guide final design of the pipelines.

I2-6 The commenter indicates that winter use statistics and acreage lost should be quantified, and that additional pipelines crossings and mitigation for other pipeline areas should be provided. See Response A4-12 regarding visitor use statistics and Response I2-4 regarding affected acreage. See also Response A4-8 regarding underground pipeline crossings. The inclusion of approximately 30 underground pipeline crossing locations included as part of the Proposed Action and approximately 10 crossing locations required for deer mitigation over approximately 9.2 miles of pipelines would provide sufficient crossing locations for skiers and other recreation users, including cross-country uses.

I2-7 The commenter indicates that signage is not sufficient mitigation for safety hazards. Mitigation measures beyond signage have been identified. Mitigation Measure REC-3 includes information regarding pipeline locations at nearby recreation sites / campgrounds, access points, and the mammoth Lakes Visitor Center. In addition, operational vehicle speed shall be limited to 15 miles per hour and signage shall be installed. It should be noted however that because of the large area covered by forest, unforeseen dangers occur in any forest area that can present challenges for visitors to have a safe visit and require visitor awareness, in addition to the implementation of Project-specific mitigation measures.

I2-8 The commenter indicates that impacts on summer recreation are not described. See Responses A4-10 and A4-12, and the text revision included in Response A4-7.

I2-9 Refer to Responses A4-18 through A4-21 for discussion related to noise impacts on Shady Rest Park, and refer to Response A4-7 for discussion of effects on recreational activity at Shady Rest Park.

I2-10 The report (*Economic Benefits of the Proposed Casa Diablo Geothermal Power Plant*, Wahlstrom & Associates, 2012) has been provided in Appendix G of the Final EIS/EIR. This report was provided by the Applicant and independently reviewed by the BLM, USFS, and GBUAPCD and their NEPA and CEQA contractor.

I2-11 The commenter summarizes the previous comments that recreational opportunities will be lost as a result of implementing the CD-IV Project. The commenter is referred to Draft EIS/EIR Section 3.14 and 4.14 for a complete analysis of impacts of the CD-IV Project on recreation. This comment does not identify specific deficiencies in the Draft EIS/EIR to allow for a detailed response. Refer to Responses I2-2 through I2-9.

Letter I3 – Responses to Comments from Jim Paulus, PhD

I3-1 The comment is an introductory statement and it is understood that further elaboration is forthcoming in subsequent comments.

I3-2 The comment requests clarification of statements related to wildlife movement and in particular to barriers to deer movements. The commenter cites a 2011 summer residency and fall migration deer study from the Project area and notes that the Draft EIS/EIR is justified to conclude that a single above ground pipeline will alter but not impede the movement of mule deer and other highly mobile species. The commenter questioned the Draft EIS/EIR conclusion that a double or triple pipeline could alter, but would not impede deer movement. Depending upon the selected alternative, between 3.5 miles (Alternative 1) and 3.9 miles (Alternative 2) of double pipelines would be installed (Table ES-1, page ES-6), in some cases adjacent to an existing pipeline. Page 4.4-17 of the Draft EIS/EIR discloses that the power plant and pipelines, "would introduce new barriers to mule deer migration moving downslope from north to south to access meadow and riparian communities associated with Mammoth Creek." The Draft EIS/EIR analysis indicates that mule deer would continue to migrate across the pipeline alignment using designated overpasses and underpasses that allow for wildlife movement across pipeline corridors. The analysis cites that deer readily traverse underground sections of the Basalt Canyon Pipeline (Draft EIS/EIR, page 4.4-16) and overhead passages would additionally benefit mule deer. The inclusion of designated crossing sites, as required by Mitigation Measure WIL-4, provides areas for deer to cross multiple pipelines without the need to jump double or triple pipes.

The commenter notes that the analysis would be strengthened if it explained how the pipelines, as proposed, would impact every movement corridor that was identified in 2011. An analysis of mule deer migration was presented in the Draft EIS/EIR (page 4.4-14, et seq.), noting that the Round Valley herd and the Casa Diablo herd traverse the CD-IV Project area. It is anticipated that deer attempting to move along traditional pathways will be thwarted and their movement will be funneled into designated overhead and underground crossing locations. Additionally, the Draft EIS/EIR concludes that partial closure of deer movement corridors located between the existing MP-I and MP-II/PLES-I plant sites for the proposed M-I plant site would not substantially change the use of the movement corridor by resident deer (Draft EIS/EIR page 4.4-17).

I3-3 The commenter states that the Draft EIS/EIR does not sufficiently address potential impacts to deer movement related to increased noise, light, and traffic that were identified in the Draft EIS/EIR, or address wildlife impacts associated with dogs, increased predation, or trash. It is suggested that the analysis and associated mitigation could be modeled after the EIR discussion for the M-1 Project at Casa Diablo.

The Draft EIS/EIR adequately discusses potential impacts to deer due to increases in noise, lighting and traffic that are associated with the Project (page 4.4-18). The analysis identifies that a potential effect could occur to wildlife; however, the mechanism and

magnitude of the potential effects cannot be known, particularly because design, and avoidance and minimization measures would reduce the magnitude of the effect. Potential impacts to wildlife related to traffic are adequately addressed though mandatory speed limits that are established by Mitigation Measure AQ-3, which defines speed limits on unpaved roads at 15 mile per hour.

The comment notes that mitigation measures to address potential impacts to wildlife from off-leash dogs could be modeled after those provided in the M-1 Project EIR is noted. Upon review, the M-1 EIR does not identify potential impacts to wildlife from off-leash dogs, but does provide mitigation to generally address dog-related impacts to wildlife. Recreational dog walking presently occurs in the Project area and the proposed site use is consistent with BLM requirements. Given the existing background level of recreational dog use in the Project area, measures to reduce the impacts of dogs to wildlife are not considered warranted.

The commenter states that increased predation could occur due to the increased availability of human food and trash. With regard to wildlife impacts due to increased predation from accumulated trash, the substation and power plant would be located within fenced, locked facilities that would not be accessible to predatory species. Solid waste materials (trash) would be inaccessible to wildlife and would be routinely collected and deposited at an authorized landfill. Therefore, accumulated food trash is not expected to attract new predators to the Project area.

In response to the comment, Mitigation Measure WIL-7, below, is added to clarify required elements of the project design that have been incorporated into the Project. Project noise that is generated during construction and operations would be minimized though the implementation of Mitigation Measure NOI-1 through NOI-3, which are sufficient to minimize potential noise impacts to wildlife. However, Mitigation Measure WIL-7 is additionally required to minimize lighting effects on wildlife.

WIL-7. The following measures are required to protect mule deer and general wildlife:

a) External safety lighting associated with Project construction and operations shall be designed to minimize effects to wildlife and lighting of natural habitat at night. Operational lighting at the plant site and well sites would be directed downward and shielded, or directed inward away from natural habitat and wildlife movement corridors.

b) To the maximum extent feasible, all noise-generating construction activities on Project linear corridors shall be limited to daylight hours.

c) During construction and decommissioning, solid waste materials (trash) shall be stored in containers that are inaccessible to wildlife. Trash shall be routinely collected and deposited at an authorized landfill to avoid attracting predators to the Project area.

I3-4 The commenter notes that operational noise levels presented in the Draft EIS/EIR will be greater than pre-project conditions, and requests that the potential noise impacts of pump and power plant operations upon deer and wildlife be more fully discussed.

As stated in the Draft EIS/EIR, much of the ambient noise in the area is primarily traffic noise from U.S. Highway 395 and SR 203. Sound levels recorded 100 feet from existing well pumps (58 dBA) are considerably quieter than highway noise (65 dBA) (Draft EIS/EIR page 3.11-7). Thus, noise levels during operations will be similar to pre-project conditions. The best available scientific data on the subject of deer habitat use following the construction of facilities, which examined movement patterns in the Project area, indicates that deer continue to use habitats uniformly near operating plants, following facility perimeter fencing closely despite the noise and activity in these geothermal areas of operation (Draft EIS/EIR page 4.4-17). As presented in the Draft EIS/EIR, once deer have acclimated to the sounds associated with facilities, noise effects on deer are expected to be negligible. Because sound levels will be relatively quiet during operations relative to the ambient (highway) noise, effects to other wildlife species are also expected to be nominal.

I3-5 The commenter clarifies that the data cited by the Draft EIS/EIR for the M-1 Project did not take into account the larger CD-IV Project area, and suggested inclusion of the larger data set. In response to the comment, the statement on Draft EIS/EIR page 4.4-17 is revised as follows:

> The deer could alternatively be redirected to the east of the existing facilities, where existing high-traffic deer trails exist with no additional known threats. Based upon usage data generated by the fall 2011 track study, it is estimated that up to 40 to 50 summer-resident deer, up to ~~1~~300 migrating deer (+/- 20 to 40), and up to ~~10~~5 to 20 winter resident deer could be redirected through or around the Casa Diablo geothermal complex in one direction or the other (Paulus, 2012a).

I3-6 Commenter requests removal of the Paulus (2009) citation which states that fawns require 16 inches clearance to pass under a pipeline. In response to the comment, the statement on Draft EIS/EIR page 4.4-8 is revised as follows:

> However, young deer may not jump over the pipeline, and they typically require at least 16 inches clearance to go under a fence (~~Paulus, 2011b~~ Wyoming Game and Fish Department, 2004).

I3-7 The comment requests clarification as to why Project impacts to natural vegetation communities as summarized in Draft EIS/EIR Table 4.3-2 on page 4.3-7 will not have a significant impact on deer foraging, fawn rearing, and movement due to habitat loss or fragmentation.

The loss of natural habitat and corresponding effects on wildlife including deer are discussed on Draft EIS/EIR page 4.4-28 under the heading *Habitat Connectivity and Wildlife Movement.* The Draft EIS/EIR acknowledges that loss of habitat will have an

adverse impact to migratory wildlife. However, as presented in the *Habitat Connectivity and Wildlife* discussion, substantial amounts of habitat and extensive habitat connectivity will remain following both the project-level and cumulative development scenarios. Additionally, much of the habitat loss would occur adjacent to existing facilities (e.g., existing pipelines), which would minimize habitat fragmentation and related impacts to wildlife use compared to new alignments that were not near existing facilities.

I3-8 The commenter states that the Draft EIS/EIR discussion that that all deer pass through the existing Casa Diablo geothermal complex does not convincingly support the discussion of potential impacts to deer. A second comment requests clarification of deer migratory routes as initially presented by Monteith (2009).

The Draft EIS/EIR statement on page 4.4-16 simply presents deer track data that finds that some deer traverse the Casa Diablo geothermal complex during their normal movement patterns. The statement does not, and was not meant to imply that all deer travelling from Mammoth Creek region to the southwest to areas further north necessarily traverse the Casa Diablo geothermal complex.

The statement in WIL-5 references "suspected traditional migratory routes" and is consistent with the interpretation provided by Paulus's (2012b) Figure 3, Round Valley Herd migration routes. The statement in WIL-5 that "underground segments shall be located in alignment with suspected traditional migratory routes" is accurate, even though Monteith's (2009) sample size represented relatively few deer. The reported movement corridors represent the best available data depicting how mule deer may move through the Project area, and also illustrate how other local deer movement pathways relate to those in the Project area.

I3-9 The comment suggests clarification of Figure 4.4-5. Other suggestions are provided to strengthen the Draft EIS/EIR setting and Mitigation Measure WIL-5 relative to deer use. The comment cites that an overhead crossing may be in a different location than stated in Mitigation Measure WIL-5.

Comments related to Figure 4.4-5 have been incorporated into the Draft EIS/EIR. The locations of known pipeline gaps/crossings were not available for inclusion in Draft EIS/EIR Figure 4.4-5.

The comment that the number of deer crossings varies is correct, as the number of crossings varies by project alternative. The Proposed Project (Figure 4.4-2) and Alternative 3 (Figure 4.4-4) each have 32 road crossings, while Alternative 2 (Figure 4.4-3) has 31 road crossings. The presentation of road crossing sites is consistent between these figures and the discussion in WIL-4 and WIL-5.

The comment that Draft EIS/EIR Mitigation Measure VIS-2(c) is inconsistent with the Draft EIS/EIR discussion of wildlife movement is accurate. As noted in the Project Description (Draft EIS/EIR page 2-29), vertical expansion loops are retained in the

project design; however, Mitigation Measure VIS-2(c) prohibits vertical expansion loops. While equivalent in function to vertical expansion loops, horizontal loops do not provide comparable movement opportunities for deer and other large wildlife species. As a result of this potential conflict, pipeline segments located in high wildlife use areas immediately south of Highway 395 and between well pad sites 57-25 and 66-25 (see Figure 4.4-5) shall additionally incorporate underground segments if horizontal segments are adopted in lieu of overhead segments. Mitigation Measure WIL-5 is revised as follows:

> **Mitigation Measure WIL-5:** The proposed pipelines running parallel to the existing Basalt Canyon pipeline shall be installed underground in alignment with the existing underground sections in order to provide a clear visual corridor for migrating deer. The underground sections shall be a minimum of 30 feet in length. In most cases these segments occur at existing roads, which mule deer habitually use for movement. Segments that are parallel to the existing Basalt Canyon pipeline in areas where there are currently no underground segments shall be installed underground at a prescribed frequency. These underground segments shall be located in alignment with suspected traditional migratory routes (see Figure 4.4-1). At this time, constructing underground segments in the existing Basalt Canyon pipeline is not proposed, as deer readily pass over the single pipeline. In addition to these underground segments, ~~overhead~~ underground pipeline segments shall be installed at high movement areas identified to the immediate south of Highway 395 and between well pad sites 57-25 and 66-25 (see Figure 4.4-5). ~~These~~ If used, overhead segments shall be of sufficient height to allow wildlife and people to pass under the pipeline. Alternately, underground segments shall be a minimum of 30 feet in length. It should be noted that these proposed migratory crossing requirements should be viewed primarily as conceptual and should be used to guide final design of the pipelines.

The locations of road crossing sites are presented in the Draft EIS/EIR for each alternative (e.g., see Figures 4.4-2, 4.4-3, and 4.4-4). The precise location of proposed overhead pipeline segments remains outstanding, pending final Project design; however, WIL-5 (Draft EIS/EIR page 2-57) presents two locations as within, "high movement areas identified to the immediate south of Highway 395 and between well pad sites 57-25 and 66-25." The comment that deer crossing locations should be sited in relatively high use areas is noted, and is consistent with the presentation provided in Mitigation Measure WIL-5.

The comment regarding horizontal expansion loops is noted.

I3-10 The commenter states that botanical baseline surveys have been conducted across the entire Project extent and that the Draft EIS/EIR should be revised to reflect this. In response to this comment, the following revisions have been made to the Draft EIS/EIR:

(Section 3.3, *Biological Resources – Vegetation*, page 3.3-1 third paragraph, under Section 3.3):

The ~~P~~Project area for vegetation resources includes National Forest System lands administered by Inyo National Forest. The ~~p~~Project area where vegetation communities were characterized and special-status plant and noxious weed surveys were performed included the immediate footprint for the geothermal power plant site(s), the geothermal well sites, proposed access roads, and a 300-foot wide survey corridor for pipeline routes. ~~Surveys for new access roads will be conducted in spring and summer, 2013.~~

(Section 3.3, *Biological Resources – Vegetation*, page 3.3-3, Table 3.3-1, under Section 3.3.1.3):

TABLE 3.3-1
PROJECT VEGETATION COMMUNITIES

Project Area	Vegetation Communities	Constraints	Data Sources
Proposed Action Power Plant Site	Jeffrey Pine Forest (100%)		Paulus 2012a ~~2002~~
Alternative 2 Power Plant Site	Jeffrey Pine Forest (60%) Sagebrush Scrub (40%) (approximately)		Review of aerial photographs and site reconnaissance; Paulus 2012a~~2002 (in part); studies to be conducted~~
Well 12-25	Mechanically disturbed (well completed)		Paulus 2009f
Well 14-25	Mechanically disturbed (well completed)		Paulus 2009e
Well 15-25	Jeffrey Pine Forest (100%)		Paulus 2009e
Well 25-25	Jeffrey Pine Forest (100%)		Paulus 2009e
Well 34-25	Jeffrey Pine Forest (90%) Sagebrush Scrub (10%)		Paulus 2009e
Well 38-25	Jeffrey Pine Forest (100%)	Cheat grass present.	Paulus 2008; Paulus 2009e
Well 50-25			Paulus 2012a~~No site specific study; studies at this will site will conducted~~
Well 56-25	Sagebrush Scrub (50%) Jeffrey Pine Forest (50%)	Pine fritillary present	Paulus 2009e
Well 81-36	Sagebrush Scrub (90%) Jeffrey Pine Forest (10%)	Cheat grass present.	Paulus 2008; Paulus 2009d
Well 77-25	Sagebrush Scrub (60%) Jeffrey Pine Forest (40%)	Pine fritillary present. Cheat grass present.	Paulus 2009e
Well 26-30	Sagebrush Scrub (85%) Jeffrey Pine Forest (15%)		Paulus 2009f
Well 12-31	Sagebrush Scrub (100%)	Cheat grass present.	Paulus 2008; Paulus 2009d
Well 12A-31	Sagebrush Scrub (100%)		Paulus 2009d

TABLE 3.3-1 (Continued)
PROJECT VEGETATION COMMUNITIES

Project Area	Vegetation Communities	Constraints	Data Sources
Well 23-31	Sagebrush Scrub (100%)	Cheat grass present.	Paulus 2008; Paulus 2009d
Well 35-31	Sagebrush Scrub (90%) Jeffrey Pine Forest (10%)	Cheat grass present.	Paulus 2008; Paulus 2009d
Well 55-31	Sagebrush Scrub (95%) Jeffrey Pine Forest (5%)	Cheat grass and Russian thistle present.	Paulus 2008; Paulus 2009d
Well 55-32	Mechanically disturbed		Paulus 2009b
Well 65-32	Mechanically disturbed		Paulus 2009b
Proposed Action Pipeline alignment	Jeffrey Pine Forest and Sagebrush Scrub	Cheat grass present.	Paulus 2009c Paulus 2009b Paulus 2009f
Alternative 3 – Modified Pipeline Alignment	Sagebrush Scrub	Cheat grass and Russian thistle present.	Paulus 2010~~No site-specific studies on differences; studies to be conducted~~

I3-11 The commenter correctly states that permanent vegetation removal on 30 percent of the pipeline corridors seems overstated and also requests clarification throughout the document on which impacts to vegetation are permanent and which are temporary. The 30 percent estimate for permanent impacts along the pipeline corridors was provided by the applicant for use in the Draft EIS/EIR and was contained in the Project Description. This description in the Project Description failed to indicate that the 30 percent estimate also included roadways. Section 2.2.5.4, *Site Preparation and Associated Surface Disturbance*, has been revised as follows:

> The production and injection system pipeline corridors would use previously disturbed ground along existing access roads to the fullest extent practical. Construction corridors would be less than 40 feet (12 meters) wide, although expansion joints/loops may have a wider corridor. Travel outside the construction corridors would be strictly limited to designated turnout areas and access roads. After construction, the corridor would be revegetated in accordance with an approved USFS revegetation plan, seed mix, and monitoring plan. Vegetation removal on approximately 30 percent of the pipeline construction corridor would be permanent due to pipeline piers, ~~and~~ footings, and associated roadways.

The calculations used in the impact analysis were obtained by GIS data. Temporary and permanent impacts to vegetation are defined in the Draft EIS/EIR (page 4.3-2) and were used as the basis for the calculations. The analysis throughout Sections 4.3 and 4.4 of this EIS/EIR relies on these definitions and these terms are used consistently through these sections where needed. However, to clarify which impacts are permanent and which are temporary, the following revisions have been made to the Draft EIS/EIR Section 4.3, *Biological Resources – Vegetation*, page 4.3-7, Table 4.3-1, under Section 4.3.4.1:

TABLE 4.3-1
ACRES OF VEGETATION DISTURBED (acres)[a]

	Alternative 1 – Proposed Action	Alternative 2 – Plant Site Alternative	Alternative 3 – Modified Pipeline Alternative
Power Plant Site (permanent)	6.5 acres	7.3 acres	6.5 acres
Substation (permanent)	0.25 acres	0.25 acres	0.25 acres
Transmission Line (Estimated 50 feet wide corridor) (permanent)	0.75 acres	5.61 acres	0.75 acres
Geothermal Pipeline (temporary) (Estimated 40 feet wide corridor)	27.5 acres	26.9 acres	26.3 acres
Geothermal Pipeline (permanent)	pipeline piers and footings only	pipeline piers and footings only	pipeline piers and footings only
Well Field (temporary)	33.6 acres	33.6 acres	33.6 acres
Well Field (permanent)	6.4 acres	6.4 acres	6.4 acres
Well Field Access Roads (permanent)	1.4 acres	1.4 acres	1.4 acres
Total Acres Disturbed (Temporary)	**61.1 acres**	**60.5 acres**	**59.9 acres**
Total Acres Disturbed (Permanent)	**15.3 acres**	**20.96 acres**	**15.3 acres**

NOTE:
[a] Estimated Acreages

I3-12 The commenter raises concerns regarding multi-agency approval for revegetation plans and monitoring of biological resources. The USFS is the managing agency for the surface lands in the Project area. Therefore, in response to this comment, the following revisions have been made to the Draft EIS/EIR:

(Section 4.3, *Biological Resources – Vegetation*, page 4.3-19, second paragraph under Section 4.3.9):

> ***Revegetation of Temporarily Disturbed Areas.*** Per PDM ~~BIO-3~~ BIO-2, ORNI 50, LLC shall prepare and implement a Revegetation Plan to restore all areas subject to temporary disturbance to pre-Project grade and conditions. The Revegetation Plan will not be implemented until it is approved by an Inyo NF botanist who is familiar with the project environment.

(Section 4.3, *Biological Resources – Vegetation*, page 4.3-19, fourth paragraph under Section 4.3.9):

> ***Landscaping.*** Any vegetation planted for landscaping or visual shielding purposes shall be reviewed by USFS ~~and BLM~~ personnel prior to installation.

(Section 4.3, *Biological Resources – Vegetation*, page 4.3-19, fifth paragraph under Section 4.3.9):

> **Mitigation Measure VEG-2: Weed Management Plan.** ORNI 50, LLC shall implement a Weed Management Plan that meets the approval of ~~BLM and~~ the USFS.

(Section 4.3, *Biological Resources – Vegetation*, page 4.3-19, sixth paragraph under Section 4.3.9):

> The Plan would be consistent with ~~BLM and~~ USFS practices and would be implemented by ORNI 50, LLC to reduce the potential for the introduction of invasive species during construction, operation and maintenance, and decommissioning of the CD-IV Project. The draft plan would be reviewed and approved by ~~the BLM and~~ the USFS.

I3-13 The commenter states that Project Design Measures (PDM) BIO-6, BIO-7, and BIO-8 should be PDM BIO-5, BIO-6, and BIO-7, and Mitigation Measure VEG-2 need to be modified to clarify the point(s) at which weed monitoring, reporting, and remediation begin. The commenter also requests clarification of the required length of monitoring. In addition, the commenter requests that the submission and approval of the Weed Management Plan should be done as a series of plans and timetables due to the phased schedule for Project implementation. Lastly, the commenter states that the texts of PDMs must match throughout the Draft EIS/EIR. See Common Response 3 in Section 6.4.3 concerning the text of PDMs. In response to this comment, the following mitigation measure revises PDMs BIO-5, BIO-6, and BIO-7 and has been added to the Final EIS/EIR, Section 4.3, *Biological Resources – Vegetation*:

> **Mitigation Measure VEG-3:** This mitigation measure shall modify PDMs BIO-5, BIO-6, and BIO-7: All weed monitoring and weed control remediation efforts shall commence at the start of construction activities and shall continue for the duration of the permit.

In addition, in response to this comment the following revisions have been made to the Draft EIS/EIR, Section 4.3, *Biological Resources – Vegetation*, page 4.3-19, fifth paragraph under Section 4.3.9:

> The Weed Management Plan shall include at a minimum the following information: specific weed management objectives and measures for each target non-native weed species; baseline conditions; a map of existing weed populations; weed risk assessment and measures to prevent the introduction and spread of weeds; monitoring and surveying methods; and reporting requirements. The Weed Management Plan shall include specific implementation requirements for each phase of the Project.

I3-14 The commenter requests additional details be added to Mitigation Measure VEG-2 in order to clarify further what is required in the Weed Management Plan. The Weed Management Plan is intended to be developed with detailed methodologies, thresholds for significance, and remediation schemes for weed management and will elaborate extensively on the measures presented in Mitigation Measure VEG-2. However, in response to this comment, the following revisions have been made to the Draft EIS/EIR, Section 4.3, *Biological Resources – Vegetation*, page 4.3-21, first paragraph under Section 4.3.9:

> Control methods shall be implemented when measurable weed increases~~, as well as~~ or visually verified increases~~, are~~ occur that span two or more consecutive years of monitoring results collected at the end of the growing season ~~are detected during monitoring~~.

I3-15 The commenter requests revision of the definition of early growing season. The commenter also points out a typo. In response to this comment, the following revisions have been made to the Draft EIS/EIR, Section 4.3, *Biological Resources – Vegetation*, page 4.3-21, second paragraph under Section 4.3.9:

> General management and monitoring of the ~~P~~Project area shall be conducted by designated site personnel each year during both the germinating and early growing season ~~(November through April)~~ to eliminate new weed individuals prior to seed set. The early growing season for weedy annuals is February or March in the warmest zones of the thermally disturbed habitat, and from April to June outside of thermally disturbed habitat.

In addition, in response to this comment, the following revisions have been made to the Draft EIS/EIR, Section 4.3, *Biological Resources – Vegetation*, page 4.3-21, third paragraph under Section 4.3.9:

> Copies of each annual report shall be sent to the BLM and USF~~W~~S for review and comment.

I3-16 The commenter requests clarification of wording describing past revegetation at Basalt Canyon. The commenter also requests a discussion of past revegetation efforts in forest and scrub habitats at Basalt Canyon, Upper Basalt, and Casa Diablo. In response to this comment, the following revisions have been made to the Draft EIS/EIR, Section 3.3, *Biological Resources – Vegetation*, page 3.3-6, first paragraph under Section 3.3.1.3:

> Meanwhile, several pipeline corridors that cross through the ~~P~~Project area (pipelines are elevated on 1-2 feet stilts) have attained a high degree of native vegetative recovery through revegetation methods implemented following construction of the pipelines. Pipeline corridors constructed in the early 1990s are now largely indistinguishable from the surrounding vegetation types. Revegetation efforts following facilities development in forest and scrub habitat at Basalt Canyon, Upper Basalt, and Casa Diablo have resulted in successful, relatively rapid reestablishment of native plants, consistent with Project performance criteria for native plant restoration.

I3-17 The commenter states that sheep grazing and revegetation are incompatible and requests that sheep grazing be excluded in those areas undergoing active revegetation and revegetation monitoring. In response to this comment, the following mitigation measure has been added to the Final EIS/EIR, Section 4.3, *Biological Resources – Vegetation*:

Mitigation Measure VEG-1.6: In all years when active revegetation or revegetation monitoring is prescribed at Basalt Canyon and Upper Basalt, the District Ranger who is responsible for issuing the annual operating instructions for the Sherman/Deadman Sheep and Goat Allotment will include instructions that the active revegetation area and associated bed areas are to be avoided by sheep herders during that year.

I3-18 The commenter states that inconsistency in use of plant community names could cause confusion. Specifically, the sagebrush scrub community is inconsistently named throughout the document, varying between "Sagebrush Scrub", "Big Sagebrush Scrub", and "Great Basin Mixed Scrub". In response to this comment, the following footnote has been made to the Draft EIS/EIR:

(Section 3.3, *Biological Resources – Vegetation*, page 3.3-3, second paragraph under Section 3.3.1.3):

This community[1] is dominated by sagebrush and antelope bush, which provide an average cover of approximately 30 to 50 percent.

[1] This community is also referred to as big sagebrush scrub and Great Basin mixed scrub in this document.

I3-19 The commenter states that there are inconsistencies, contradictions, or inaccuracies in the description of the Affected Environment for wetlands and waters of the U.S. The commenter further states that because of these supposed deficiencies, the conclusions regarding potential impacts to wetlands and/or waters of the U.S. are not supported. Finally, the commenter requests specific mitigation to minimize impacts to wetlands and waters of the U.S. PDMs to minimize potential impacts to wetlands and waters of the U.S. are included in the Draft EIS/EIR (PDMs HYD-1 through HYD-7). No further mitigation is necessary.

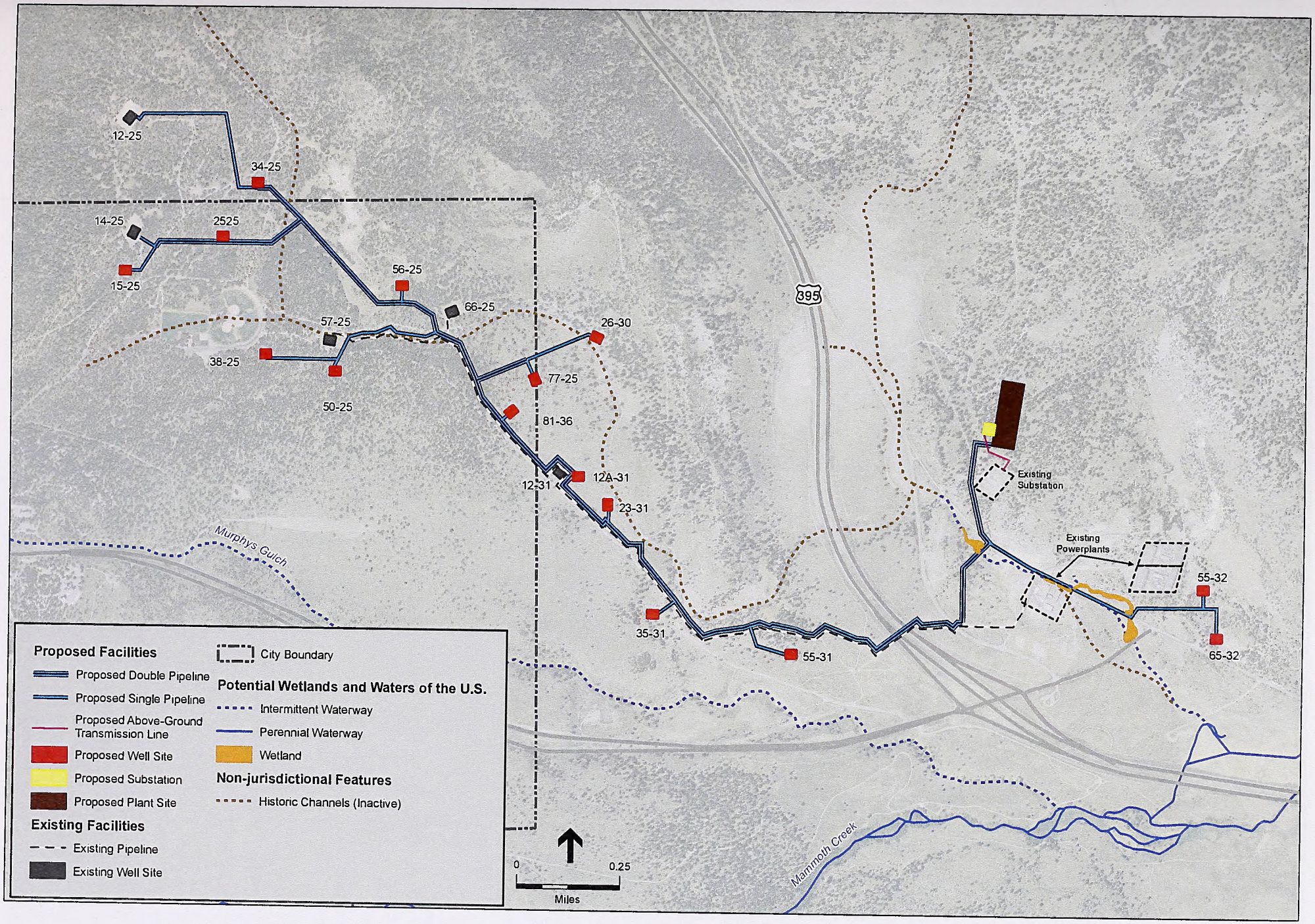
In response to this comment, the following revisions have been made to the Draft EIS/EIR:

(Section 3.3, *Biological Resources – Vegetation*, under Section 3.3.1.6):

Add new Figures (Figures 3.3-2 and 3.3-3).

(Section 3.3, *Biological Resources – Vegetation*, page 3.3-5, under Section 3.3.1.3):

Douglas' Sedge Meadow/Creeping Rye Grass Meadow. These wetland plant communities are found within and adjacent to the stream channel flowing through the existing Casa Diablo complex within a relatively densely vegetated 10-30 foot wide corridor occupying the central channel and the first flood plain terrace. They are dominated by Douglas' sedge (*Carex douglasii*) and creeping rye grass (*Leymus triticoides*), respectively. Associated species include cheat grass, Mexican rush (*Juncus mexicanus*), and salt grass (*Distichlis spicata*). These communities are both currently regulated as "special status" vegetation communities by the CDFW.

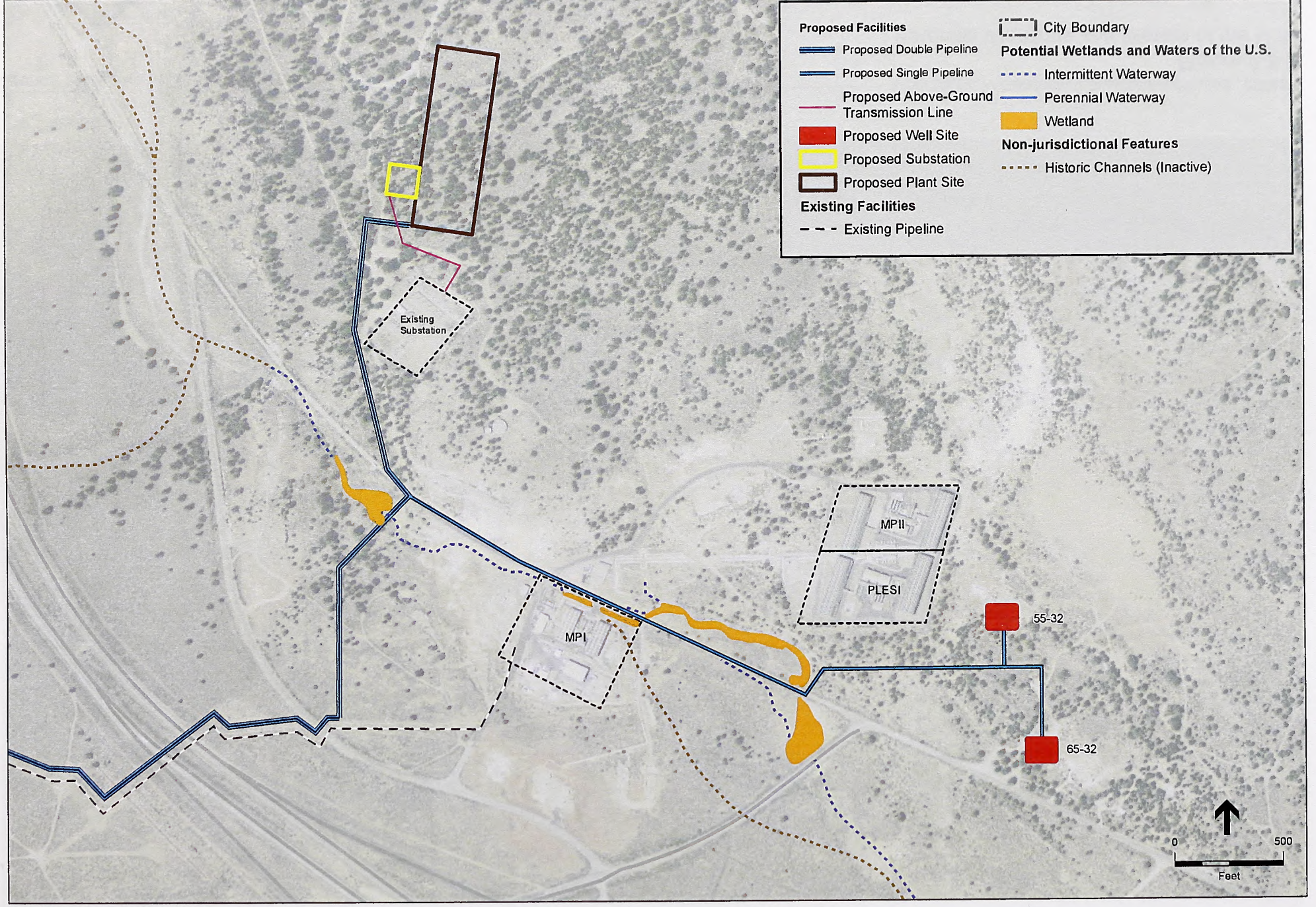


SOURCE: FEMA, 2010; NHD, 2011; Ormat, 2011

Casa Diablo IV Geothermal Development Project . **209487**

Figure 3.3-2

Potential Wetlands and Waters of the U.S.



SOURCE: FEMA, 2010; NHD, 2011; Ormat, 2011

Casa Diablo IV Geothermal Development Project . **209487**

Figure 3.3-3

Potential Wetlands and Waters of the U.S.

(Section 3.3, *Biological Resources – Vegetation*, page 3.3-11, fifth paragraph under Section 3.3.1.6):

> A total of 1.89 acres of potentially jurisdictional wetlands (Douglas' sedge meadow and creeping ryegrass meadow) were mapped within the ~~P~~Project area, all in close proximity to the existing power plant facilities (see Figure 3.3-3). These potentially jurisdictional wetlands are found within and adjacent to the stream channel flowing through the existing Casa Diablo complex. The "blue line" drainage that through the Casa Diablo Geothermal Lease area shows a clear and continuous ordinary high water mark until its connection to Mammoth Creek. It is therefore likely a jurisdictional water of the U.S. (see Figure 3.3-2). The assessment performed by Paulus (Paulus, 2012) determined that the "blue line" drainages in Upper Basalt and Basalt Canyon were likely not jurisdictional under the CWA ~~except for in the area of the existing power plants~~ (see Figure 3.3-2). These features are likely "isolated" features due to large gaps in function and physical characteristics. ~~Areas upstream from this~~ "Blue line" features in Upper Basalt and Basalt Canyon did not exhibit continuous indicators of a defined bed and bank and an ordinary high water mark ~~and therefore do not meet the definition of jurisdictional waters under the CWA~~. No wetland or riparian areas were located along the "blue line" drainages in Upper Basalt or Basalt Canyon. The assessment performed by Paulus (Paulus, 2012) has not been reviewed by the USACE and should be considered preliminary until official review and verification by the USACE.

(Section 3.3, *Biological Resources – Vegetation*, page 3.3-18, first paragraph under Section 3.3.1.6):

> ~~Shifts in species frequencies relative to the surrounding vegetation communities were not considered significant enough to map these potential wetland areas as separate plant communities. These areas may meet jurisdictional criteria established by the U.S. Army Corps of Engineers (USACE) and RWQCB pursuant to their Clean Water Act regulatory activities.~~

(Section 3.4, *Biological Resources – Wildlife*, page 3.4-2, second paragraph under Section 3.4.1.3):

> Wildlife habitats within the p~~P~~roject area include Jeffrey pine forest, pinyon-juniper woodland, sagebrush scrub, Douglas' sedge/creeping ryegrass meadow, and barren (thermally disturbed and mechanically disturbed).

(Section 3.4, *Biological Resources – Wildlife*, page 3.4-3, second paragraph under Section 3.4.1.3):

> ~~There are no perennial streams or other surface waters located within the Project area, nor are there any springs, seeps or wet swales, which would provide habitat for riparian or aquatic wildlife. The two drainage systems which have each been identified as ephemeral/intermittent RCAs by the USFS within the Project area do not support any riparian vegetation and do not provide any habitat for riparian or aquatic wildlife.~~

(Section 4.3, *Biological Resources – Vegetation*, page 4.3-8, second paragraph under Section 4.3.4.1):

> Direct impacts to potentially jurisdictional features in the study area are not expected. Project facilities were located and designed to avoid direct impacts to wetlands and waters of the USA number of pipeline corridors do cross potentially jurisdictional wetlands and waters of the U.S. in the vicinity of the existing Casa Diablo facility (see Figure 3.3-3). However, pipelines in these areas will span all potentially jurisdictional features and no supporting structures will be placed within potentially jurisdictional features. This will avoid any direct impacts to those features. ~~are not planned for those areas identified during vegetation surveys that support vegetation typically associated with wetlands.~~ RCAs in the study area will be avoided to the extent feasible through implementation of Mitigation Measure SW-7 ~~PDM HYD-2, which requires pipelines and access roadways to be located outside of any delineated RCAs~~.

I3-20 The commenter states that PDM HYD-2 is contradicted in parts of the Draft EIS/EIR, and that the designation and extent of Riparian Conservation Areas (RCAs) is not clear. In essence, RCAs are areas where the USFS examines proposed projects and/or actions more carefully with respect to potential impacts to riparian areas and streams, but these are not zones of exclusion per any law or policy. As illustrated in the Draft EIS/EIR, many of the channels in the vicinity of the Proposed Action and Alternatives are no longer active channels and/or show no fluvial characteristics, and it is unlikely they would qualify for the RCA designation as defined by the USFS. In response to this comment, the following mitigation measure revises PDM HYD-2 and has been added to the Final EIS/EIR, Section 4.19, *Water Resources*:

> *SW-7*: This mitigation measure shall modify PDM HYD-2 – To the extent feasible, the pipeline route and any access roads shall avoid RCAs. Any additional action, requirements, and/or designations with respect to RCAs shall be based upon guidance from USFS staff and consistent with the relevant USFS policy.

I3-21 The commenter states that PDM HYD-2 is contradicted in parts of the Draft EIS/EIR, and that the designation and extent of Riparian Conservation Areas (RCAs) is not clear. See Response I3-20.

I3-22 The commenter states that there are inconsistencies, contradictions, or inaccuracies in the description of the Affected Environment for sensitive meadow communities and jurisdictional areas. Response I3-19 clarifies the identified portion of the Draft EIS/EIR.

Letter I4 – Responses to Comments from Brigitte Berman

I4-1 As described on Draft EIS/EIR page 4.2-10 and Response A8-6, H_2S may temporarily be released from the geothermal fluid to the atmosphere for several hours to 30 days during

well testing activities; however, these concentrations would not be expected to pose a health hazard and would not reach far beyond the vicinity of the well under normal conditions. Based on laboratory analysis of noncondensible gases obtained from existing well site 14-25, it is estimated that noncondensible gas released from the geothermal fluid during proposed flow testing would have a relatively low concentration of H_2S of approximately 35 parts per million (Thermochem, 2010). In addition, Mitigation Measure AQ-4 has been added to the Draft EIS/EIR to ensure that potentially hazardous emissions concentrations related to release of H_2S during well testing are adequately controlled. See Response A8-6. Under normal operating conditions, geothermal gases would not be vented to the atmosphere because the geothermal fluid would be contained within a closed-loop heat exchanger system and then reinjected back into the geothermal reservoir.

I4-2 The comment claims that the CD-IV Project should not be located near the Shady Rest, recreational sports facility. As discussed in the Draft EIS/EIR Section 4.13.4.1, the geothermal power plant and substation would be located to the east of U.S. Highway 395, a sufficient isolation distance from the recreational sports facility at Shady Rest. Please refer to Response I4-1. The Project proposes PDMs and mitigation measures designed to avoid potential leaks and spills in the well field near Shady Rest. The CD-IV Project would be required to comply with hazardous materials regulations and would adhere to spill or discharge contingency planning.

Letter I5 – Responses to Comments from CONSPEC Inc.

I5-1 The commenter expresses support for the CD-IV Project. This comment is noted.

I5-2 The commenter states that the questions from the union should be disregarded. This comment is noted.

Letter I6 – Responses to Comments from Bill Taylor

I6-1 The commenter indicates that quantitative assessment of dispersed recreation was not included. See Responses A4-12 and A4-9, and changes to the text included in Response A4-7 that more clearly identify cross country uses and effects on those uses as a result of the Proposed Action.

I6-2 The commenter indicates that Figure 3.14-1 and 3.14-2 do not show all the trails regularly used. Draft EIS/EIR Figures 3.14-1 and 3.14-2 include all mapped and identified roads and trails, as available from the USFS, Town of Mammoth Lakes, MLTPA, and other mapping resources. The figures include recreation routes around the southwestern and eastern portion of Shady Rest Park, and west of Sawmill Cutoff Road, as mentioned by the commenter.

I6-3 The commenter indicates that roads closed to motor vehicles are used by non-motorized recreationists and that dispersed recreation also occurs. See Draft EIS/EIR page 3.14-1,

which acknowledges that 'unauthorized roads' are closed to motorized use, but are available to non-motorized recreation use. Also see Responses A4-7, A4-8, A4-9, and A4-12, and changes to text included in Response A4-7 that more clearly identify cross country uses and effects on those uses as a result of the Proposed Action.

I6-4 The commenter requests that annual user data and trail information be collected. See Responses A4-12 and I6-2.

I6-5 The commenter indicates that baseline recreation data is incomplete and the section should be revised. See Responses A4-12 and I6-2.

I6-6 As described in Section 4.14, *Recreation,* of the EIS/EIR, the Project would result in one permanent road closure (NFSR 03S129E) and could result in temporary road closures during the construction period, including on Roads 03S08N and 03S08P, and potentially other roads. Construction activities would occur primarily in the non-winter seasons of 2013 and 2014 (and potentially 2015), and would affect use of Alternative 1 area roads and trails shown on Figure 3.14-1, which are also used for walking, jogging, bicycling, and OHV uses. Given the availability of recreation opportunities in the region, such as the hundreds of miles of NFSRs and unauthorized roads, increased use of regional recreational facilities and roads/trails would not result in substantial use of other resources. However, due to altered recreational conditions in the Shady Rest area, some minor localized economic indirect effects could occur if recreational use habits change.

In response to Comment I6-6 and I1-31, Draft EIS/EIR page 4.15-5, paragraph 2 has been revised:

> **Operation and Maintenance**
>
> Ongoing operation and maintenance of the Project would generate beneficial economic impacts through the same mechanisms that were described above for construction, although at a much smaller scale. The six new permanent jobs in the county would each have an average annual salary of $100,000, resulting in a total of approximately $600,000 per year in new job wages with benefits being in addition (Wahlstrom & Associates, 2012). Operation of the proposed facilities would also likely create occasional spending within the local and regional economies for supplies, services, and repairs, estimated at $225,000 (Wahlstrom & Associates, 2012). Through economic multiplier effects, the direct spending by ORNI 50, LLC on operation and maintenance (including wages and salaries for the new workers) would have small additional beneficial economic expansion impacts through indirect and induced effects. Due to altered recreational conditions in the Shady Rest area, some minor localized economic indirect effects could occur if recreational use habits change.

I6-7 The commenter indicates that pipelines should be underground at every trail and road crossing. See Responses A4-8 and I2-6.

I6-8 The commenter indicates that the pipeline should be placed underground at intervals of no less than 300 feet to accommodate dispersed recreation use. See Responses A4-8 and I2-6.

I6-9 The commenter indicates that operational winter access to well facilities should be restricted to OSV to reduce the need for road plowing. Geothermal project operations necessitate daily inspections of production and injection wells and site access for the maintenance of production well facilities, particularly in the event of an emergency. Maintenance and emergency equipment cannot be transported on an OSV to the well sites; therefore, it is necessary to plow all access routes to and around the production well pads in order to access the well sites for these activities. Further, roads would need to be plowed to allow for large vehicle passage that would be required to carry equipment if there is a production pump at the site. OSV use doesn't allow for those types of operations to occur in the lower part of lower Basalt Canyon as the snow isn't the same as in the upper reaches, where such operations could occur by OSV use. However, as discussed in Response A4-9, Mitigation Measure REC-3 has been revised to require that grade changes resulting from road plowing be gradual in areas where cross country use is prevalent.

I6-10 The commenter indicates that the document should be revised to incorporate the amount and types of dispersed recreation occurring in the Project vicinity. See Response A4-12.

Letter I7 – Responses to Comments from Mammoth Nordic

I7-1 The commenter indicates that the Project will affect the aesthetic quality and safety of the Nordic experience. See Responses A4-7 and A4-8. The commenter also references previously submitted comments (July 2001, August 2002, November 2006, March 2010, and April 2011). It is noted that the April 2011 letter attached to EIS/EIR comment letter I7 was submitted during the public scoping period and the content of that letter was considered as part of the EIS/EIR analysis (see Appendix A). The earlier letters reflect comments and concerns raised in the 2011 scoping letter and EIS/EIR comment letter I7 and do not raise additional concerns or comments not otherwise addressed, or include content regarding other projects or project elements no longer under consideration.

I7-2 The commenter indicates that proposed wells would be audible and visible to Nordic recreation users. See Draft EIS/EIR pages 4.14-6 and 4.14-7 regarding and visual resources effects. As discussed, operation of the geothermal power plant and wells would include air emissions controls (Mitigation Measure AQ-5). While ambient noise levels would be increased in the immediate vicinity of the power plant and wells, trail and road users passing these sites would be in the vicinity of these facilities for brief periods. Therefore, substantial long-term air quality and noise impacts on recreation users would not occur. Although a significant environmental impact has not been identified associated with pump noise under CEQA, the USFS has recommended implementation of mitigation to ensure that there would be no adverse effects under NEPA related to well pump noise disturbance

of Shady Rest Park users (see response to Comment A4-18). Also, as discussed in Section 4.18, *Visual Resources*, the Proposed Action includes several PDMs that reduce the effect of Project facilities on aesthetic resources. Section 4.18 also includes several mitigation measures that further reduce the effect of Project facilities on aesthetic resources.

I7-3 The commenter indicates that several established Nordic trail alignments would be affected, aboveground pipelines create barriers and safety hazards, and underground crossings create safety hazards. See Responses A4-8 regarding Nordic trail alignments and A4-7 andA4-9 regarding cross-country crossing of pipelines. Refer to Responses A4-16 regarding snowmelt conditions and I2-7 regarding safety hazards.

I7-4 The commenter indicates that Mammoth Nordic shares the concerns raised by the Town of Mammoth Lakes. This comment is noted. See Responses A4-1 through A4-31.

Letter I8 – Responses to Comments from Ormat

I8-1 The commenter states that well pad 14-25 is incorrectly shown as larger than the other well pads in Figure 1-1 and all well field figures. The commenter states that all well pads would be the same size upon completion. Figure 1-1 in the Draft EIS/EIR showed the entire area of disturbance and the final well pad area following restoration. All applicable figures have been updated to show the final operational size of the well pad 14-25 similar to other proposed wells.

I8-2 The commenter requests clarification that only new access roads from the primary existing road to the well pad would be improved with a durable road base. The Forest Service is required to adhere to Best Management Practices (BMPs) in order to comply with the requirements of the Clean Water Act, State Water Resources Control Board, and the Regional Forest Service Water Quality Management Handbook. These BMPs do not permit snow plowing on Native Surface roads. Therefore all roads requiring all-weather access and snow plowing, and not just new access roads, will require a hardened surface, which includes installation of aggregate, road base or paving.

I8-3 The BMPs and Recommendations for Snow Plowing on Native Surface Roads have been modified to be specific to the CD-IV Project (see Appendix B). The recommendations have been revised after further review and revisions are included in this document. These BMPs for Snow Plowing on Native Surface Roads are required in order to comply with the requirements of the Clean Water Act, State Water Resources Control Board, and the Regional Forest Service Water Quality Management Handbook. The Forest Service has no authority to allow the applicant to deviate from these requirements specified herein.

Revisions to the BMP requirements include reducing the depth of snow that must remain on the road after plowing from one foot to 3 inches. This depth should be sufficient to protect the road surface while allowing vehicles to access the well sites. The revised BMPs for Snow Plowing have included language that states "All roads that will be plowed, including existing roads, must have a hardened surface. Hardening includes

aggregate, road base of paving. There can be no plowing on native surface roads that do not have some sort of improved and hardened surface." It is the goal of the Forest Service that the installation of aggregate material on roads to be plowed and adherence to other BMPs for snow plowing will meet the intent of the Water Quality Management Handbook. Paving would only be required if the intent of the Handbook cannot be met through the implementation of other BMPs.

I8-4 The inclusion of road widening and paving in Alternative 3 is at the discretion of the lead NEPA and CEQA agencies. The CD-IVProject pipelines and winter plowing operations of the applicant would result in effects on recreational access in the vicinity of the Project. Therefore, Alternative 3 was developed to reduce the effects of proposed operations on recreational access and was determined to be within a reasonable range of alternatives to be considered under CEQA and NEPA. Preliminary analysis determined this action to be feasible, and would serve to alleviate some of the potential for road damage from CD-IV construction activities, and potential effects on recreational access. However, the multiple use nature of the road is recognized, and the potential impacts of road widening on Project area resources were discussed in the EIS/EIR as part of construction impacts considered for Alternative 3.

I8-5 Section 2.2.9, *Project Design Measures for Environmental Protection*, TR-2 has been amended as follows:

Traffic/Access/Circulation

1. *TR-1*: ORNI 50, LLC will meet Caltrans' encroachment permit requirements in order to construct the pipeline under U.S. Highway 395.

2. *TR-2*: ORNI 50, LLC will maintain Sawmill Road (03S25) and Sawmill Cutoff Road (03S08) during construction operations to ensure that the road beds are equal to documented pre-construction conditions.

I8-6 The steps to comply with Section 106 have been altered, based on discussions and meetings with the BLM, USFS, and OHP. In response to this comment, the following revisions have been made to the Draft EIS/EIR Section 4.6, *Cultural and Paleontological Resources*:

Page 4.6-1:

> The structure of the cultural resources analysis for the Proposed Action accommodates both the primary need of GBUAPCD to demonstrate, under CEQA, a consideration of the potential for the Project to affect cultural resources and the primary needs of the BLM to conduct similar analyses under NEPA and Section 106. The present analysis is intended to fulfill the largely parallel goals of the regulatory programs through the execution of ~~five basic~~ analytic phases. Details of these phases follow below and provide the parameters of the present analysis.

1. The initial phase determined the appropriate geographic extent or Area of Potential Effects (APE) of the analysis for the Proposed Action and for each alternative action under consideration. The APE ~~include~~ includes an area sufficient to accommodate all of the proposed Project facilities under consideration.

2. The second phase produced inventories of the cultural resources within the APE. MACTEC (2012) reported on a Class III cultural resource inventory of the APE in *A Class III Cultural Resources Inventory for the Basalt Canyon Project, Mono County, California.* The Bureau of Land Management, Bishop Field Office (Haverstock, 2012) performed additional survey, reported in *An Expanded Cultural Resources Inventory Report for the Proposed Casa Diablo IV Geothermal Project.* Figure 3.6-1 shows the extent of these surveys, which covered areas designated under Alternatives 1-3. ~~, except for the well location 26-30 (under Alternative 3 only). No surface disturbing activity will occur in this area (well 26-30 and its associated pipeline until a cultural survey has been completed.~~

3. The third phase determined ~~whether particular~~ means to avoid cultural resources ~~in an~~ identified by the inventory ~~are historically significant, and which resources can be avoided by~~ during construction.

4. The fourth phase ~~assessed the character and the severity of the impacts of the Proposed Action and alternatives on the historically significant cultural resources that cannot be avoided in each respective inventory.~~ created a Memorandum of Agreement between interested and consulting parties, outlining the mechanisms for site avoidance.

Page 4.6-2:

5. The final phase ~~proposes~~ creates a Historic Properties Avoidance Plan, incorporating avoidance measures, and details actions in case of inadvertent discoveries that would resolve significant impacts.

National Register eligibility recommendations have been made for archaeological resources (see Table 4.6-1; Pacific Legacy, 2009; MACTEC, 2012; Haverstock, 2012). Formal concurrence has not yet been made by the USFS or the SHPO. For the purposes of this analysis, all resources without existing formal National Register eligibility determinations are assumed to be National Register eligible. Prehistoric resources will typically be evaluated for their contribution to the as-yet-defined Casa Diablo Obsidian National Register District (described in Chapter 3.6).

Avoidance of cultural resources is always the preferred alternative. Table 4.6-1 also notes mechanisms for ~~when~~ the Proposed Action and Alternatives ~~were able~~ to avoid sites (Proposed Action and Alternatives further discussed below).

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TABLE 4.6-1
SUMMARY OF NATIONAL REGISTER ELIGIBILITY AND TREATMENT RECOMMENDATIONS FOR ARCHAEOLOGICAL SITES

Site Designation	NRHP Recommendation	Closest Project Component	Actions to Avoid and Recommendation
FS 05045200307 Prehistoric site	District contributor	existing road	Monitor capping of the archaeological deposit within the roadway with geo-textile cloth and sterile soil. ~~Alternative 3 is designed to avoid cultural resources. When this is possible, no further treatment is necessary.~~
FS 05045100314 Prehistoric site	District contributor	well pad	Alternative 3 is designed to avoid cultural resources. ~~When this is possible, no further treatment is necessary.~~ Fence during construction and monitor.
FS 05045200389 Prehistoric site	not elgibile		BLM determined that FS 05045200389 is not an archaeological site. No further treatment is required.
FS 05045200297a Prehistoric site	not eligible	pipeline	Recorded by MACTEC but does not meet BLM site definition. No further treatment is required. ~~No treatment.~~
FS 05045200297b Prehistoric site	P-District contributor	well pad & pipeline	BLM finds site boundaries smaller than MACTEC and site outside pipeline and well pad. Move pipeline within existing dirt road off site. Fence during construction and monitor.
FS 0504520024 Locus 391 Prehistoric and historic components	P-District contributor H-unevaluated	wellpad	Alternative 3 is designed to avoid cultural resources. ~~When this is possible, no further treatment is necessary.~~ Fence during construction and monitor.
FS 05045200026 Prehistoric and historic components	P-District contributor H-not eligible	well pad, pipeline, roads	~~No treatment. Portion of site within Direct APE tested and determined no a contributor to NRHP eligibility of site.~~ Alternative 3 is designed to avoid cultural resources. Fence during construction and monitor. Monitor capping of the archaeological deposit within the roadway with geo-textile cloth and sterile soil.
ACH-02 Prehistoric site			Site redefined by BLM as CD4-02 and CD4-03 (see below).
ACH-03 Prehistoric site	District contributor	pipeline	Alternative 3 is designed to avoid cultural resources. Fence during construction and monitor. ~~Move pipeline or conduct phased data recovery.~~
ACH-04 Historic site	not eligible	wellpad	No treatment.
ACH-05 Prehistoric site	District contributor	pipeline & wellpad	Alternative 3 is designed to avoid cultural resources. Fence during construction and monitor. ~~Move well page & pipeline or conduct phased data recovery.~~
ACH-06 Prehistoric site	District contributor	wellpad	Alternative 3 is designed to avoid cultural resources. ~~When this is possible, no further treatment is necessary.~~ Fence during construction and monitor.
ACH-07 Historic site	not eligible	pipeline	No treatment.

TABLE 4.6-1 (Continued)
SUMMARY OF NATIONAL REGISTER ELIGIBILITY AND TREATMENT RECOMMENDATIONS FOR ARCHAEOLOGICAL SITES

Site Designation	NRHP Recommendation	Closest Project Component	Actions to Avoid and Recommendation
ACH-09 Prehistoric site	District contributor	existing road	Monitor capping of the archaeological deposit within the roadway with geo-textile cloth and sterile soil. ~~Move pipeline or conduct phased data recovery.~~
ACH-11 Prehistoric and historic components	P-District contributor H-not eligible	pipeline	Alternative 3 is designed to avoid cultural resources. Fence during construction and monitor. ~~Alternative 3 is designed to avoid prehistoric component. When this is possible, no further treatment is necessary. Fence during construction.~~ No further treatment needed for historic component.
ACH-12 Historic site	not eligible	pipeline	No treatment.
ACH-13 Prehistoric site	District contributor	wellpad	Alternative 3 is designed to avoid cultural resources. ~~When this is possible, no further treatment is necessary.~~ Fence during construction and monitor.
ACH-14 Historic site	unevaluated	pipeline	Alternative 3 is designed to avoid cultural resources. Fence during construction and monitor. ~~Alternative 3 is designed to avoid cultural resources. When this is possible, no further treatment is necessary.~~
ACH-15 Prehistoric and historic components	P-District contributor H-not eligible	wellpad	Alternative 3 is designed to avoid cultural resources. Fence during construction and monitor. ~~Move well pad to avoid site. Fence during construction~~. No further consideration for historic component.
ACH-16 Prehistoric site	District contributor	existing road	Monitor capping of the archaeological deposit within the roadway with geo-textile cloth and sterile soil. ~~Alternative 3 is designed to avoid cultural resources. When this is possible, no further treatment is necessary.~~
ACH-17 FS 05045202199 Historic site	unevaluated	pipeline	Alternative 3 is designed to avoid cultural resources. Fence during construction and monitor. ~~Alternative 3 is designed to avoid cultural resources. When this is possible, no further treatment is necessary.~~
CD4-S1 FS 05045202183 ACH-01	District contributor	existing road	No deposit in road based on previous testing. Fence road edges during construction.
CD4-S1H	not eligible	existing road	No treatment.
CD4-S2 FS 05045202184	District contributor	new road	Monitor ~~Monitored~~ capping of the archaeological deposit within the roadway with geo-textile cloth and sterile soil.
CD4-S2H Historic site	not eligible	existing road	No treatment.
CD4-S3 FS 05045202184	District contributor	pipeline	Limit construction of pipeline to existing pipeline corridor through site or ~~conduct phased data recovery~~. Alternative 3 is designed to avoid cultural resources. Fence during construction and monitor.

TABLE 4.6-1 (Continued)
SUMMARY OF NATIONAL REGISTER ELIGIBILITY AND TREATMENT RECOMMENDATIONS FOR ARCHAEOLOGICAL SITES

Site Designation	NRHP Recommendation	Closest Project Component	Actions to Avoid and Recommendation
CD4-S3H Historic site	not eligible	wellpad	No treatment.
CD4-S4 FS 0504520024 Locus 297	P-District contributor	well pad	Alternative 3 is designed to avoid cultural resources. ~~When this is possible, no further treatment is necessary.~~ Fence during construction and monitor.
CD4-S4H Historic site	eligible	existing road	Monitor capping of the archaeological deposit within the roadway with geo-textile cloth and sterile soil. ~~Alternative 3 is designed to avoid cultural resources. When this is possible, no further treatment is necessary.~~
CD4-S5 Prehistoric site	District contributor	pipeline	Alternative 3 is designed to avoid cultural resources. Fence during construction and monitor. ~~Move pipeline outside of site boundaries. Impose permit conditions or conduct phased data recovery.~~
CD4-S5H Historic site	not eligible	existing road	No treatment.
CD4-S6 Prehistoric site	District contributor	well pad	Alternative 3 is designed to avoid cultural resources. Fence during construction and monitor. ~~Alternative 3 is designed to avoid cultural resources. When this is possible, no further treatment is necessary.~~
CD4-S6H Historic site	not eligible	pipeline	No treatment.
CD4-S7 Prehistoric site	District contributor	pipeline	Alternative 3 is designed to avoid cultural resources. Fence during construction and monitor. ~~Alternative 3 is designed to avoid cultural resources. When this is possible, no further treatment is necessary.~~
CD4-S7H FS 0504200024/ Locus ACH-8 Historic site	not eligible	existing road	No treatment.
CD4-S8 Prehistoric site	District contributor	existing road	Monitor capping of the archaeological deposit within the roadway with geo-textile cloth and sterile soil. ~~Alternative 3 is designed to avoid cultural resources. When this is possible, no further treatment is necessary.~~
CD4-S8H Historic site	eligible	existing road	Monitor capping of the archaeological deposit within the roadway with geo-textile cloth and sterile soil. ~~Alternative 3 is designed to avoid cultural resources. When this is possible, no further treatment is necessary.~~
CD4-S9 FS 05045200923 Prehistoric site	District contributor	existing road	No treatment. Continued use of existing paved road through site will not cause project effects.
CD4-S10 Prehistoric site	District contributor	existing roads	Monitor ~~Monitored~~ capping of the archaeological deposit within the roadway with geo-textile cloth and sterile soil.

TABLE 4.6-1 (Continued)
SUMMARY OF NATIONAL REGISTER ELIGIBILITY AND TREATMENT RECOMMENDATIONS FOR ARCHAEOLOGICAL SITES

Site Designation	NRHP Recommendation	Closest Project Component	Actions to Avoid and Recommendation
CD4-S11 Prehistoric site	District contributor	pipeline	Alternative 3 is designed to avoid cultural resources. Fence during construction and monitor. ~~Alternative 3 is designed to avoid cultural resources. When this is possible, no further treatment is necessary.~~
CD4-S12 Prehistoric site	District contributor	one new road one existing road	Alternative 3 is designed to avoid cultural resources. Fence during construction and monitor. Monitor capping of the archaeological deposit within the roadway with geo-textile cloth and sterile soil. ~~Alternative 3 is designed to avoid cultural resources. When this is possible, no further treatment is necessary. Fence during construction. BLM will impose standard permit conditions.~~
FS 0504200024 Locus 297c (CD4-S13)/CD4-S13/14 Prehistoric site	District contributor	pipeline	Multiple recommendations: Monitor ~~Monitored~~ spanning of pipeline over site area; site area has exhausted data potential.
CD4-S15 FS 05045200297x Prehistoric and historic components	P-District contributor H-unevaluated	pipeline	Alternative 3 is designed to avoid cultural resources. Fence during construction and monitor. ~~Alternative 3 is designed to avoid cultural resources. When this is possible, no further treatment is necessary.~~
CD4-S16 Prehistoric site	District contributor	pipeline	Alternative 3 is designed to avoid cultural resources. Fence during construction and monitor. ~~Alternative 3 is designed to avoid cultural resources. When this is possible, no further treatment is necessary.~~
CD4-S17/H FS 05045202199 Prehistoric and historic components	P-District contributor H-unevaluated	Pipeline	Alternative 3 is designed to avoid cultural resources. Fence during construction and monitor. ~~Alternative 3 is designed to avoid cultural resources. When this is possible, no further treatment is necessary. Fence during construction.~~
CD4-S18H Prehistoric and historic components	P-District contributor H-not eligible	pipeline	Alternative 3 is designed to avoid cultural resources. Fence during construction and monitor. ~~Move pipeline outside of site boundaries. Impose permit conditions or conduct phased data recovery.~~

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TABLE 4.6-2
SUMMARY OF PROPOSED ACTION, ALTERNATIVES, AND IMPACTS

Action Type	Action	Impact to Resources
Alternative 1. Proposed Action		
Construction	Construction of Alternative 1 would require clearing and grading of the temporary and permanent disturbance areas.	Modifications to the design of Alternative 1 have been made with the intent of avoiding direct physical impacts to most cultural resources within the footprint of the CD-IV Project. Impacts would still potentially occur to sites within the APE as well as to ~~the potential~~ sites associated with the National Register Historic District. Due to various surface conditions or changes over time, not all cultural resources are expressed on the surface. Any project with ground disturbing components has the potential to directly impact unanticipated cultural resources. The concentration of archaeological sites in the vicinity suggests that this potential exists in the APE. Construction of Alternative 1 may result in inadvertent discoveries of cultural resources. Implementation of the PDMs and Mitigation Measure CUL-8 would ensure that the worker training program reduce the risk of direct impacts to cultural resources within the Project APE and that work stop in the vicinity of an unanticipated discovery.
Operation and Maintenance	Day to day operations; periodic maintenance to existing equipment	The primary potential for direct impacts to cultural resources is from unanticipated damage or inadvertent discoveries. Because operation and maintenance activities would be limited to the approved construction footprint of Alternative 1, with the exception of roads maintained/plowed during Project operations that do not require upgrades or revisions during Project construction, no additional direct impacts to cultural resources are expected during operation and maintenance. During operation and maintenance, the PDMs and the MOA would reduce the risk of adverse impacts to cultural resources within the Project APE. Avoidance and protection of potentially significant resources during the operation and maintenance phase of the Project ~~through implementation the HPMP and HPTP~~ would protect cultural resources ~~originally~~ avoided by construction impacts.
Decommissioning	Decommissioning of Proposed Action would include dismantling the power plant and well-field and restoring the site to pre-Project conditions.	Because decommissioning activities are similar in nature to construction activities, the PDMs and mitigation measures developed for construction activities would be applied during the decommissioning phase, including protocols related to the protection of cultural resources from adverse impacts. With implementation of ~~the~~ an MOA ~~and HPMP~~, decommissioning effects on any known or unknown historic and archaeological resources would be mitigated by ensuring identification, evaluation, avoidance, and protection of resources.
Alternative 2. Alternative Plant Location		
Construction	Construction of Alternative 2 would require clearing and grading of the temporary and permanent disturbance areas.	Both direct and indirect construction impacts for Alternative 2 are similar to Alternative 1.
Operation and Maintenance	Similar to Alternative 1.	Both direct and indirect operation and maintenance impacts for Alternative 2 are similar to Alternative 1.
Decommissioning	Similar to Alternative 1.	Both direct and indirect decommissioning impacts for Alternative 2 are similar to Alternative 1.

TABLE 4.6-2 (Continued)
SUMMARY OF PROPOSED ACTION, ALTERNATIVES, AND IMPACTS

Action Type	Action	Impact to Resources
Alternative 3. Modified Pipeline Alternative		
Construction	Both direct and indirect construction impacts for Alternative 3 are similar to Alternative 1, the proposed Project. There is a reduction in the potential for unanticipated discoveries of cultural resources on Alternative 3 relative to the reduction in the operation and maintenance footprint compared to the Proposed Action.	Other than Alternative 4 (No Action), Alternative 3 would impact the fewest sites, as its design avoids cultural resources. There remain several locations at which Project facilities cross or overlap with historic properties. Engineering plans for CD-IV Project Alternative 3 have not been finalized, and minor adjustments to the Alternative 3 design can be made. There is considerably flexibility of location and design for most Project facilities (well pads, pipelines, new access roads, transmission line). Due to various surface conditions or changes over time, not all cultural resources are expressed on the surface. Any project with ground disturbing components has the potential to directly impact unanticipated cultural resources. The concentration of archaeological sites in the vicinity suggests that this potential exists in the APE. Construction of Alternative 1 may result in inadvertent discoveries of cultural resources. Impacts would still potentially occur to sites within the APE as well as to the potential National Register Historic District.

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Section 4.6.2 discusses project design measures implemented prior to construction, with the intent of avoiding cultural resources. Implementation of PDMs will avoid the ~~majority~~ surface of known archaeological sites, but some impacts potentially remain. **Mitigation Measures CUL-1 through CUL-8** (detailed below in Section 4.6.5) have been formulated to ensure that Project construction effects on cultural resources would be mitigated by ensuring identification, evaluation, avoidance, and protection of resources. Construction of all alternatives would also occur in full compliance with the PDMs (see Section 4.6.2, *Project Design Measures*).

~~Based on the Section 106 Consultation process the BLM has determined that the sites and potential Historic District may be adversely affected by the implementation of the Proposed Project, and is consulting with SHPO, ACHP, USFS, and the Tribes on means of reducing adverse effects. **Mitigation Measure CUL-8** would ensure continued consultation with Tribes and reduction of adverse effects to the potentially significant sites and/or a significant district.~~

A Memorandum of Agreement (MOA) will be negotiated through additional Section 106 consultation (**Mitigation Measure CUL-1**). A Historic Property ~~Treatment~~ Avoidance Plan ~~(HPTP)~~ will be developed as an appendix to the MOA. ~~The MOA will also identify potential additional mitigation to resolve adverse effects and provide cultural resource protection, including development of a Historic Properties Management Plan (HPMP), and public outreach.~~

Due to various surface conditions or changes over time, not all cultural resources are expressed on the surface. Any project with ground disturbing components has the potential to directly impact unanticipated cultural resources. The concentration of archaeological sites in the vicinity suggests that this potential exists in the APE. Construction of all alternatives may result in inadvertent discoveries of cultural resources. Based on the Section 106 Consultation process the BLM has determined that subsurface expressions of previously unrecorded sites and potential Historic District may be adversely affected by the implementation of the Proposed Project, and is consulting with SHPO, USFS, and the Tribes on means of reducing adverse effects. Implementation of the PDMs and **Mitigation Measure CUL-6** would ensure that the worker training program reduce the risk of direct impacts to cultural resources within the Project APE and that work stop in the vicinity of an unanticipated discovery. **Mitigation Measure CUL-8** would ensure continued consultation with Tribes and reduction of adverse effects to the potentially significant sites and/or a significant district.

Operation and Maintenance

The primary potential for direct impacts to cultural resources during the operation and maintenance phase is from unanticipated damage or inadvertent discoveries. Because operation and maintenance activities would be limited to the approved

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TABLE 4.6-3
CEQA SIGNIFICANCE DETERMINATION

Criteria	Action Type	Action	Impact to Resources
a) Cause a substantial adverse change in the significance of a historical resource as defined in § 15064.5	Construction	Construction would require clearing and grading of the temporary and permanent disturbance areas.	As described above, the Proposed Action could potentially impact known and not-yet-discovered historical resources (as defined in CCR 14 15064.5) during the construction phase. These impacts may ~~would~~ be significant. ~~However implementation~~ Implementation of the MOA and HPMP, as well as implementation of the PDMs would reduce impacts to historical resources to a less-than-significant level.
	Operation and Maintenance	Day to day operations; periodic maintenance to existing equipment	As described above, the Proposed Action could potentially impact known and not-yet-discovered historical resources (as defined in CCR 14 15064.5) during the operation and maintenance of the CD-IV Project. These impacts may ~~would~~ be significant. ~~However implementation~~ Implementation of mitigation measures to be defined in the ~~HPMP and HPTP~~ Historic Properties Avoidance Plan, as well as implementation of the PDMs would reduce impacts to historical resources to a less-than-significant level.
	Decommissioning	Decommissioning of Proposed Action would include dismantling the power plant and well-field and restoring the site to pre-Project conditions.	As described above, the Proposed Action could impact historical resources (as defined in CCR 14 15064.5) during decommissioning of the CD-IV Project. ~~These impacts would be significant. However, implementation of mitigation measures to be defined in the HPMP and HPTP, as well as implementation~~ Implementation of the Historic Properties Avoidance Plan and the PDMs would reduce impacts to historical resources to a less-than-significant level.
b) Cause a substantial adverse change in the significance of a unique archaeological resource pursuant to § 15064.5	Construction	Similar to criterion a above.	As described above, the Proposed Action could impact unique archaeological resources [as defined in section 21083.2(g)] during the construction phase. ~~These impacts would be significant. However, implementation of mitigation measures to be defined in the HPMP and HPTP, as well as implementation of the PDMs would reduce impacts to unique archaeological resources to a less than significant level.~~ Implementation of the Historic Properties Avoidance Plan and the PDMs would reduce impacts to historical resources to a less-than-significant level.
	Operation and Maintenance	Similar to criterion a above.	As described above, the Proposed Action could impact unique archaeological resources [as defined in section 21083.2(g)] during the operation and maintenance of the CD-IV Project. Implementation of the Historic Properties Avoidance Plan and the PDMs would reduce impacts to historical resources to a less-than-significant level. ~~These impacts would be significant. However, implementation of mitigation measures to be defined in the HPMP and HPTP, as well as implementation of the PDMs would reduce impacts to unique archaeological resources to a less than significant level.~~
	Decommissioning	Similar to criterion a above.	As described above, the Proposed Action could impact unique archaeological resources [as defined in section 21083.2(g)] during the decommissioning of the CD-IV Project. Implementation of the Historic Properties Avoidance Plan and the PDMs would reduce impacts to historical resources to a less-than-significant level. ~~These impacts would be significant. However, implementation of mitigation measures to be defined in the HPMP and HPTP, as well as implementation of the PDMs would reduce impacts to unique archaeological resources to a less than significant level.~~
c) Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature	This section is discussed elsewhere.		

TABLE 4.6-3 (Continued)
CEQA SIGNIFICANCE DETERMINATION

Criteria	Action Type	Action	Impact to Resources
d) Disturb any human remains, including those interred outside of formal cemeteries	Construction	Similar to criterion a above.	No known human remains are located within the CD-IV Project APE however this possibility cannot be entirely discounted. Impacts to human remains would be significant. ~~However, implementation~~ Implementation of mitigation measures, to be defined in the ~~HPMP and HPTP~~ Historic Properties Avoidance Plan during construction of the Proposed Action, as well as implementation of the PDMs would reduce impacts to human remains to a less-than-significant level.
	Maintenance and Operation	Similar to criterion a above.	No known human remains are located within the CD-IV Project APE however this possibility cannot be entirely discounted. Impacts to human remains would be significant. Implementation of mitigation measures, to be defined in the Historic Properties Avoidance Plan during construction of the Proposed Action, as well as implementation of the PDMs would reduce impacts to human remains to a less-than-significant level. ~~However, implementation of mitigation measures to be defined in the HPMP and HPTP, as well as implementation of the PDMs would reduce impacts to unique archaeological resources to a less than significant level.~~
	Decommissioning	Similar to criterion a above.	No known human remains are located within the CD-IV Project APE however this possibility cannot be entirely discounted. Impacts to human remains would be significant. Implementation of mitigation measures, to be defined in the Historic Properties Avoidance Plan during construction of the Proposed Action, as well as implementation of the PDMs would reduce impacts to human remains to a less-than-significant level. ~~However, implementation of mitigation measures to be defined in the HPMP and HPTP, as well as implementation of the PDMs would reduce impacts to unique archaeological resources to a less than significant level.~~

construction footprint of Alternative 1, with the exception of roads maintained/plowed during project operations that do not require upgrades or revisions during project construction, no additional direct impacts to cultural resources are expected during operation and maintenance. During operation and maintenance, the PDMs, Mitigation Measures CUL-1 through CUL-8, and the MOA would reduce the risk of adverse impacts to cultural resources within the project APE. Avoidance and protection of potentially significant resources during the operation and maintenance phase of the Project through implementation of the ~~HPMP and HPTP~~ Historic Properties Avoidance Plan would protect known cultural resources ~~originally avoided~~ and sites inadvertently disturbed by construction impacts.

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4.6.4.4 Construction

The CD-IV Project has been designed to avoid direct physical effects to most known archaeological resources; however, the Proposed Action ~~would~~ may potentially adversely affect some ~~previously identified~~ significant historic properties and the proposed Casa Diablo Obsidian Quarry Archaeological District.

Page 4.6-19:

Mitigation Measure CUL-1: A MOA shall be prepared and shall detail: 1) procedures to resolve adverse effects under Section 106; 2) coordination between the CEQA process and Section 106 compliance; 3) procedures for treatment of inadvertent discoveries; 4) procedures for determining treatment and disposition of human remains; 5) compliance monitoring; 6) dispute resolution; 7) development of an Historic Properties ~~Treatment Plan~~ Avoidance Plan; and 8) Tribal consultation and participation. ~~Resolution of effects to cultural resources eligible for or listed in the National Register may include research and documentation, development of an Historic Properties Management Plan, data recovery excavations, curation, public interpretation, use or creation of historic contexts, and report distribution.~~

Page 4.6-20

Mitigation Measure CUL-4: A ~~HPTP~~ Historic Properties Avoidance Plan shall be developed and included in the MOA that defines and maps all known cultural resources within 150 feet of the Project APE. ~~The HPTP~~ That Plan shall also detail how resources will be marked and protected as Environmentally Sensitive Areas during construction. ~~The HPTP shall define any additional areas that are considered to be of high sensitivity for discovery of buried significant cultural resources, including burials, cremations, or sacred features. This sensitivity evaluation shall be conducted by an archaeologist who meets the Secretary of the Interior's Standards and who takes into account geomorphic setting and surrounding distributions of archaeological deposits. The HPTP~~ The Plan shall detail provisions for monitoring construction in ~~these~~ locations deemed to be

high-sensitivity areas for buried sites currently without surface manifestations. It shall also detail procedures for halting construction, making appropriate notifications to agencies, officials, and Native Americans, and assessing register-eligibility in the event that unknown cultural resources are discovered during construction. For all unanticipated cultural resource discoveries, the ~~HPTP~~ Historic Properties Avoidance Plan shall detail the methods, consultation procedures, and timelines for assessing register-eligibility, formulating a mitigation plan, and implementing treatment. Mitigation and treatment plans for unanticipated discoveries shall be approved by the USFS, BLM, and the SHPO prior to implementation.

Mitigation Measure CUL-5: Archaeological monitoring shall be conducted by a qualified archaeologist familiar with the types of historic and prehistoric resources that could be encountered within the APE, and under direct supervision of a principal archaeologist. All cultural resources personnel will be approved by the BLM and USFS. A Native American monitor may be required at culturally sensitive locations specified by the USFS following government-to-government consultation with Indian tribes. The ~~HPTP~~ Historic Properties Avoidance Plan shall indicate the locations where Native American monitors will be required and shall specify the tribal affiliation of the required Native American monitor for each location. ORNI 50, LLC shall retain and schedule any required Native American monitors.

Page 4.6-21:

4.6.6 Residual Impacts after Mitigation Incorporated

Under the Proposed Action (Alternative 1), there remains a potential for adverse effects to previously undiscovered archaeological resources, as well contributing resources to the Casa Diablo Obsidian Quarry Archaeological District, which may be discovered during construction, operation and maintenance, and decommissioning.

I8-7 The commenter clarifies that fugitive n-pentane would not leak into the geothermal lines because the pressure of the geothermal brine would be greater than the pressure of the n-pentane. Therefore, text on Draft EIS/EIR page 4.2-4 has been revised as follows:

> The fugitive n-pentane, which is considered an ROG, would be released to the atmosphere; n-pentane would not leak into pipelines due to the pressure of the geothermal brine ~~or would leak into the geothermal lines~~. As described in Section 2.6.6.5, n-pentane leak detectors would be installed throughout the power plant facility and would be continuously monitored.

I8-8 The commenter states that Project emissions should not be compared to ICAPCD significance thresholds. However, as stated on Draft EIS/EIR page 4.2-7, because the GBUAPCD does not have established CEQA significance criteria, GBUAPCD has elected to use ICAPCD's CEQA significance thresholds for this air resources analysis because Imperial County is a rural county similar to Mono County with existing and

proposed geothermal development projects, and because the Imperial County Air Basin is a federal and State non-attainment area for both ozone and PM10.

Although the CD-IV Project area is currently designated as attainment of the federal ozone standard, the GBUAPCD has determined that rural Imperial County best represents air quality conditions in the Project area and the ICAPCD's significance thresholds are supported by substantial evidence. Therefore, although the ICAPCD's ozone precursor significance thresholds may be slightly conservative for use in the Project area, the GBUAPCD continues to believe that use of the ICAPCD's significance thresholds to evaluate the CD-IV Project is prudent, given the lack of established CEQA air quality significance thresholds for the Project area.

In addition, the court has recently confirmed that lead agencies may devise significance thresholds on a project-by-project basis, and CEQA requires that a lead agency formally adopt a threshold of significance only if it is for "general use" in evaluating future projects. See *Save Cuyama Valley v. County of Santa Barbara*, Case No. B233318 (2d App. Dist. Div. 6, filed Jan. 10, 2013, modified and ordered published Feb. 8, 2013).

I8-9 The commenter appears to indicate that since some air districts in California have adopted significance thresholds for only long-term operations-related emissions, the CD-IV Project should not quantify construction emissions for comparison to significance thresholds. The fact that some air districts recommend only quantification of operation-related emissions for CEQA reviews does not preclude the GBUAPCD from doing so.

The commenter contends that the Draft EIS/EIR does not emphasize that construction-related emissions would be short-term. However, as disclosed in the first sentence of the second paragraph on page 4.2-8, the Draft EIS/EIR air resources analysis clearly emphasizes that construction emissions would be short-term.

The commenter also states that construction emissions associated with the various components of the CD-IV Project should not be presented as a combined total because some of the components are not located in the same vicinity and associated emissions would disperse before combining. For the purposes of assessing impacts to regional air quality, the significance threshold is applicable to all CD-IV Project-related emissions generated within the Great Basin Valleys Air Basin because the significance threshold is for mass emissions generated, not pollution concentrations. It is standard procedure to include all project-related emissions generated within the applicable air basin, including off-site vehicle travel emissions, when comparing emissions to mass emissions thresholds for evaluation of impacts to regional air quality.

Also, refer to Response I8-8.

I8-10 The commenter indicates that GBUAPCD's comments on the M-1 Replacement Project EIR are inconsistent with the analysis presented in the Draft EIS/EIR. However, in terms of increased long-term emissions of ozone precursors, particularly reactive organic gases

(ROG), the two projects are not comparable. The M-1 Replacement Project would result in a long-term net fugitive ROG emissions reduction of approximately 295 pounds per day compared to baseline conditions. This is in contrast to the CD-IV Project, which is estimated to result in an increase in fugitive ROG of approximately 410 pounds per day compared to baseline conditions. Although a qualitative analysis may have been appropriate for the M-1 Replacement Project, the GBUAPCD determined that a quantitative analysis was required for the CD-IV Project given the circumstances. The suggested revisions have not been incorporated.

Also, refer to Responses I8-8 and I8-9.

I8-11 The suggested revisions have not been incorporated. Refer to Responses I8-8 to I8-10.

I8-12 The suggested revisions have not been incorporated. Refer to Responses I8-8 to I8-10.

I8-13 The focus of the State's Portable Engine Airborne Toxic Control Measure (ATCM) is on particulate matter reductions and the focus of Mitigation Measure AQ-1 is on NOx reductions. The GBUAPCD statement referenced by the commenter was relative to equipment associated with first time applicants to the statewide ATCM portable equipment registration program, which must be at least tier 2. Existing equipment registered in the program may have emissions that are equal to less than tier 2 standards. Therefore, meeting current ATCM standards would not necessarily result in reduced NOx emissions. The suggested revision has not been incorporated.

I8-14 The suggested revisions have not been incorporated. Refer to Responses I8-9 and I8-10.

I8-15 The commenter provides a summary of the credentials of Ormat's reviewer for the air resources analysis. This comment is noted.

I8-16 The commenter states that past revegetation at Basalt Canyon did not occur spontaneously. The commenter also requests a discussion of past revegetation efforts in forest and scrub habitats at Basalt Canyon. See Response I3-16.

I8-17 The commenter notes a typo. In response to this comment, the following revisions have been made to the Draft EIS/EIR, Section 3.3, *Biological Resources – Vegetation*, page 3.3-11, fourth paragraph under Section 3.3.1.6:

> The USFS has designated corridors of ~~3400~~ 300 feet in width as Riparian Conservation Areas (RCA) at every USGS "blue line" drainage in the area, including those of the ~~P~~Project area (Paulus, 2012).

I8-18 The commenter states that some PDMs and mitigation measures do not match throughout the document and requests that these measures are checked for consistency. See Common Response 3 in Section 6.4.3.

I8-19 The commenter states that the Project area has low, not medium foraging and nesting habitat for Sierra marten. This is a misunderstanding of what the word "medium" refers to in this instance. The "medium" categorization refers to the "Potential to Occur in the Project Area" and is not necessarily a rating of habitat quality. In addition, the Biological Evaluation found that "Suitable marten habitat exists in the northwestern portion of the Project area in the mixed conifer area of Jeffrey pine. The majority of the Jeffrey pine stands within the Project area provide marginal quality habitat for marten due to the relative lack of snags, downed logs and large trees." Therefore, it was determined that there is a medium potential for Sierra marten to occur in the Project area.

I8-20 The commenter appears to indicate that the CEQA analysis should only state that the GBUAPCD does not have an adopted GHG emissions significance threshold and the analysis should not include the use of a quantitative significance threshold to evaluate CD-IV Project-related GHG emissions. The GBUAPCD disagrees. Comparison of Project emissions to the SCAQMD's significance threshold of 10,000 metric tons offers a conservative CEQA impact analysis of the CD-IV Project and the action alternatives. The suggested revision has not been incorporated.

I8-21 The commenter states that the Town of Mammoth Lakes does not have jurisdiction to review the grading plans for this Project and that grading plans on Public Lands are under the jurisdiction of the BLM and potentially the USFS. As discussed in the Draft EIS/EIR Section 3.8.2.3, a portion of the well pipeline would be within the Town of Mammoth Lakes municipal boundary and therefore, the EIS/EIR includes a discussion of the requirements of the Town of Mammoth Lakes in *Applicable Regulations, Plans, and Policies/Management Goals*. The Draft EIS/EIR provides information on the requirements of the Town of Mammoth Lakes because that portion of the Project within its municipal boundary may require a building or grading permit.

I8-22 The commenter states that the a Sundry Notice to perform a geotechnical investigation of the Project site was submitted in 2010 to review the appropriateness of the proposed power plant site and that the BLM should approve that Sundry Notice as soon as possible to facilitate the Project. This comment does not address the adequacy of the EIS/EIR and thus, the comment is noted and no response is provided.

I8-23 The commenter recommends deleting Mitigation Measure GEO-3 (Subsidence Monitoring and Mitigation) because of building codes and other requirements that address subsidence. Mitigation Measure GEO-3 will remain in the Draft EIS/EIR because it provides a necessary mechanism to evaluate the existing subsidence monitoring program conducted by the USGS in light of the proposed CD-IV Project. The mitigation measure requires that the USGS and all Long Valley Hydrologic Advisory Committee (LVHAC) members review the existing monitoring program to ensure adequate monitoring is conducted for the CD-IV Project. Upon review, if the USGS and LVHAC members recommend it, the current monitoring program will be expanded to include additional subsidence monitoring in the

CD-IV Project area and any areas outside the Project area that may be impacted by the expanded geothermal development.

I8-24 The commenter recommends deleting Mitigation Measure GEO-2 (Soils and Geotechnical Investigation) because basalt bedrock underlies the pipeline supports and subsidence is accounted for in the pipeline design as required by building codes. Mitigation Measure GEO-2 will remain in the Draft EIS/EIR because local building codes may not apply on federal lands and it ensures that a geotechnical study is completed that addresses various potential geologic, soil, and seismic impacts associated with the CD-IV Project.

I8-25 The commenter states that the Basalt Canyon Area and the entire Long Valley Caldera are part of the LVHAC review area and Mitigation Measure GEO-3 is unnecessary because the required monitoring is already being done. Mitigation Measure GEO-3 was intended to specifically address subsidence monitoring. As noted, mitigation addressing hydrologic monitoring is redundant. The need for additional hydrologic monitoring will be evaluated by the USGS and the LVHAC and any additional monitoring deemed necessary will be required by the BLM as a Condition of Approval for the geothermal project (refer to Common Response 4, Hydrologic Monitoring in Section 6.4.3). Mitigation Measure GEO-3 has been amended as follows:

> **Mitigation Measure GEO-3:** ***Subsidence Monitoring and Mitigation.*** The existing ~~hydrologic~~ subsidence monitoring program conducted by the USGS will be reviewed by the USGS and ~~all~~ LVHAC members to ensure adequate subsidence monitoring is conducted for the CD-IV Project. Based on recommendations by the USGS and LVHAC members, the subsidence monitoring program will be expanded to include additional monitoring in the CD-IV Project area and any areas outside the Project area that may be impacted by the expanded geothermal development. If additional subsidence monitoring is deemed necessary, the Project applicant would develop a monitoring plan. The monitoring plan will include subsidence and uplift tolerances for potential impacts to infrastructure and resources, and shall prescribe particular actions~~include an action plan~~ (e.g., require discontinued or reduced pumping rates) in the event tolerances are exceeded. Additional monitoring may include ~~but is not limited to: drilling additional monitoring wells,~~ installation of new or updated monitoring equipment~~, monitoring additional thermal and non-thermal springs, monitoring of shallow groundwater wells, monitoring of additional geothermal wells, geochemical analyses, fumarole monitoring,~~ and use of current methods that can detect small-scale changes (for example utilizing InSAR data or high precision leveling methods).

I8-26 The commenter requests clarification on how the 15.3 acres of permanently removed livestock grazing habitat was calculated. This was calculated from the amount of vegetation acres permanently lost due to Project implementation (see Table 4.3-1). These areas are not

capable of being used for grazing. The commenter also requests a discussion of Project benefits for grazing. No such grazing benefits were identified during the analysis.

I8-27 The description of existing physical conditions of the CD-IV Project site is accurately described throughout the Draft EIS/EIR, including in Chapter 2, *Proposed Action and Alternatives*; Section 3.3, *Biological Resources-Vegetation*; Section 3.8, *Geologic, Soil and Mineral Resources*; and Section 3.14, *Recreation*. The commenter's proposed addition to the Land Use Section would not affect the analysis or conclusions of the Draft EIS/EIR; therefore, the requested text change has not been made.

I8-28 The commenter indicates that LADWP has purchased Chance Ranch and that no one currently lives there, so reference to it as an air quality and noise sensitive receptor should be removed from the Draft EIS/EIR. Although nobody may currently be living at the Chance Ranch residence, that does not preclude individuals from staying at the residence for extended periods of time. Therefore, the residence at Chance Ranch should continue to be considered a sensitive receptor. A footnote was added to Section 3.2.1.4, *Sensitive Receptors*, and Section 3.11.1.2, *Project Setting*, to indicate this in the document.

Section 3.2.1.4, *Sensitive Receptors*, has been amended as follows:

> However, Shady Rest Park, a Town of Mammoth Lakes sports complex, is approximately 160 feet southeast of proposed Well Site 38-25. Mammoth Elementary, Middle, and High Schools are all between approximately 0.9 and 1.1 miles from proposed Well Site 38-25, and are over 2 miles from the proposed power plant site. The closest residence to the proposed power plant site is at Chance Ranch[1], approximately 1.6 miles to the southeast, and the closest residences to a proposed well site are along Trails End Road, approximately 0.8 mile southwest of Well Sites 38-25 and 50-25.
>
> [1] LADWP has purchased Chance Ranch and it is speculated that no one currently lives there. However, for the purposes of this analysis, it is considered a sensitive receptor as individuals are not precluded from staying at the residence for extended periods of time.

The third paragraph of Section 3.11.1.2, *Project Setting*, has been amended as follows:

> The closest residence to the CD-IV power plant site is at Chance Ranch[1], approximately 1.5 miles to the southeast, and the closest residences to a proposed well site are along Trails End Road, approximately 0.8 mile southwest of Well Sites 38-25 and 50-25.
>
> [1] LADWP has purchased Chance Ranch and it is speculated that no one currently lives there. However, for the purposes of this analysis, it is considered a sensitive receptor as individuals are not precluded from staying at the residence for extended periods of time.

I8-29 The commenter suggests amending the environmental setting and description of the Project area to better describe the noise-generating recreational activities such as the use of ATVs, on-road and offroad vehicles and dirt bikes, snowmobiles, and recreational shooting. As

already disclosed on Draft EIS/EIR page 3.11-9, existing noise sources in the Project area include occasional off-road vehicles (four wheel drive vehicles, all terrain vehicles, motorcycles/ dirt bikes, and snowmobiles) as well as a target shooting range to the northeast of the Casa Diablo geothermal complex. No revisions are necessary.

I8-30 The commenter correctly indicates that the estimated daily maximum vehicle trips for Project construction identified in Section 4.11 is inconsistent with that presented in Section 4.16, *Traffic, Transportation, and Circulation*. The fourth paragraph on Draft EIS/EIR page 4.11-6 has been revised as follows to show the correct amount of maximum construction-related daily trips and to clarify that not all construction-related trips would occur on the same roads:

> As described in Section 4.16, *Traffic, Transportation, and Circulation*, construction-related traffic would be expected to result in a total of up to 554~~654~~ daily trips. Based on the estimated amount of traffic that would be generated by the CD-IV Project, and if 100 percent of CD-IV Project-related construction traffic would travel on those roads, which is unlikely, the estimated daily vehicle trips associated with concurrent construction activities would represent a~~n~~ 7~~8~~ and 12~~14~~ percent increase in daily traffic volumes on SR 203 and U.S. Highway 395, respectively.

I8-31 The commenter states that Section 4.11 does not adequately describe existing noise generated in the CD-IV Project area, and that additional context should be added to the existing noise environment. Refer to Response I8-29.

I8-32 The commenter indicates that PDMs LU-1 and VIS-3 are inconsistent. As a result, PDM LU-1 has been removed from the EIS/EIR as ORNI 50, LLC has indicated that it is not feasible as well as inconsistent with VIS-3. Section 2.2.9, *Project Design Measures for Environmental Protection*, has been amended as follows:

Land Use

~~1.~~ *LU-1*: ~~All geothermal pipelines potentially visible in scenic highway corridors or important visual areas will be obscured from view to the extent reasonably feasible by fences, natural terrain, vegetation, or constructed berms (consistent with Mono County Conservation/Open Space Element, Goal I, Objective D, Action 1.18).~~

2. ~~*LU-2:*~~ Geothermal exploration and development projects will be carried out with the fewest visual intrusions reasonably possible (consistent with Mono County Conservation/Open Space Element, Goal I, Objective F).

3. *LU-2*~~*LU-3*~~: Prior to operation of the Project, ORNI 50, LLC will prepare a Site Abandonment-Reclamation Plan in conformance with BLM and USFS requirements. When Project operations are complete, ORNI 50, LLC will restore the site to approximate pre-Project land uses according to the plan requirements.

I8-33 The analysis of impacts as presented in the Draft EIS/EIR is based on the number of daily vehicle trips associated with construction and operational activities, not on the total number

of vehicle trips over the entire construction period. The change suggested by the commenter would not change the impact determination, and therefore is not warranted.

I8-34 As stated in Section 4.16.8, *Cumulative Transportation Impacts*, the schedule of other projects is not known, and therefore the exact extent of construction traffic from concurrent construction of other projects cannot be known at this time. However, to be conservative, the cumulative analysis assumes concurrent construction. As a practical matter, identifying affected roadways from concurrent construction cannot be known at this time. Mitigation Measures TRA-1 addresses the need to coordinate with Mono County and develop a Coordinated Transportation Management Plan to prevent and/or reduce any potential cumulative traffic impacts associated with the construction of the CD-IV Project and other projects that may utilize the same roadways. The extent of the coordination required with Mono County will depend on the number of projects that will be under construction at the same time (and using the same roads) as the CD-IV Project.

I8-35 In response to this comment, the following revisions have been made to Draft EIS/EIR Section 3.17, *Utilities and Public Services*, page 3.17-2, beginning with the last sentence and continuing to page 3.17-3:

> The following ~~development~~ policies ~~standards~~ contained in the Mono County General Plan ~~Land Use Element (Mono County, 2007) and~~ Safety Element (Mono County, 1993) include ~~provide for adequate protection of utilities and~~ fire protection requirements:
>
> ~~**Land Use Element: Chapter 8, Development Standards – Scenic Combining District & State Scenic Highway**~~
>
> ~~***Section 08.030 Standards – General***~~
>
> ~~G. All new utilities shall be installed underground in accordance with Chapter 11, Development Standards – Utilities.~~

I8-36 The comment notes that planting immediately in front of certain sections of the proposed pipeline, as described in Mitigation Measure VIS-1 (Landscape Plan), is not always effective or feasible since planting needs to be conducted at the correct time of year to ensure landscaping is successful in the long-term. The comment also recommends that Mitigation Measure VIS-1 be revised to require that landscaping be completed during the proper planting season as described in the Project's revegetation plan.

In response to this comment as well as comments A4-25, I8-40, I13-19, and I14-69, Section 4.18.9 of the Draft EIS/EIR (page 4.18-30, Mitigation Measure VIS-1) is modified as follows:

> **Mitigation Measure VIS-1:** ***Landscape Plan.*** Prior to construction, ORNI 50, LLC shall prepare, submit for approval by the USFS, and implement a landscape plan that includes planting of native trees and shrub vegetation at select locations to further screen well site facilities and the geothermal pipeline from view from

Sawmill Cutoff Road (NFSR 03S08), Sawmill Road (03S25), Shady Rest Park, U.S. Highway 395, SR 203, and Knolls Loop. The landscape plan shall be coordinated with the revegetation plan (refer to Mitigation Measure VEG-1) including a monitoring and reporting plan. Permanent fencing shall be precluded to reduce potential barriers to wildlife. To minimize adverse visual effects from the abovementioned roads and park, ORNI 50, LLC shall landscape the following areas such that direct views and corners of the well facilities and pipeline are at least 65% obstructed from any location within a ten-year period. ~~at least one year prior to construction and~~If it is determined that success standards are not being met, ORNI 50, LLC shall take immediate action to re-implement the Landscape Plan to ensure compliance by the tenth-year period. At the following sites, ORNI 50, LLC shall also surround landscaped sites during construction with dark colored protective fencing:

a. The northern side of well facility site 38-25 (near Shady Rest Park)

b. Along Sawmill Cutoff Road (NFSR 03S08) (between well facility sites 15-25 and 14-25, and at the pipeline crossing near well facility site 34-25)

c. Along Sawmill Road (03S25) (between well facility sites 81-36, 12A-31, 23-31, 35-31, and 55-31)

d. At pipeline crossover near Knolls Loop (approximately 700 feet southeast of well facility site 34-25)

e. At pipeline crossovers adjacent to Sawmill Road (03S25) and Pole Line Road (NFSR 03S123) (near well facility sites 56-25,66-25, 77-25, 81-36, 12A-31, 23-31, 35-31, and 55-31)

Once the locations of proposed cross-overs and expansion loops are determined, the need for implementing this measure will be determined.

I8-37 The comment states that undergrounding long sections of the geothermal pipeline is not technically feasible in Basalt Canyon due to the uneven terrain, especially between well facility sites 34-25 and 25-25. The comment recommends that the undergrounding requirement in the Basalt Canyon area be removed from the EIS/EIR.

As described on page 4.18-30 of the Draft EIS/EIR, Mitigation Measure VIS-2 (Underground Pipeline Crossovers) requires that the height of pipeline crossovers be reduced to minimize adverse visual effects. This mitigation measure was developed and based on information provided by the applicant's design consultant. However, it is acknowledged that undergrounding long sections of the geothermal pipeline is not technically feasible in certain areas of the Basalt Canyon due to topographical changes. In response to this comment and comments A4-25, I8-41, I3-9, and I14-69, Section 4.18.9 of the Draft EIS/EIR (page 4.18-30, Mitigation Measure VIS-1) is modified as follows:

Mitigation Measure VIS-2: ~~*Underground*~~ *Pipeline Crossovers and Expansion Loops.* At locations where one pipeline crosses over another adjacent to Sawmill Road (03S25) and Pole Line Road (NFSR 03S123) (near well facility sites 56-25,66-25, 77-25, 81-36, 12A-31, 23-31, 35-31, and 55-31) and where the terrain

is not a constraining factor, ORNI 50, LLC shall reduce the height of crossovers and expansion loops by ~~implementing either of the following methods~~:

~~a. Install either the existing pipeline or new pipeline underground. To prevent snowmelt, the underground pipeline shall be insulated and a 2- to 4-inch air gap shall be maintained between the insulation and the casing pipe. The top of the casing pipe would be at least 3 to 6 feet below grade.~~

~~b.~~a. Lowering the existing pipeline or new pipeline (whichever is easiest) belowground or within a 3-foot deep trench and design the pipeline crossover with pairs of 30, 45 or 90 degree ells~~an angled bend~~ to ensure that the overall height of the crossover is at or below ~~4~~ 5.5 feet aboveground.

~~c.~~b. All expansion loops shall be ~~non-vertical~~horizontal to minimize overall height of installed pipelines to less than 45.5 feet aboveground.

I8-38 The comment states that PDM VIS-4 is inconsistent with PDM LU-1 and notes that VIS-4 is feasible, whereas LU-1 is not. The comment also recommends that PDM LU-1 be revised so that the measure can be implemented in a more feasible manner.

This comment is acknowledged. See Response I8-32. LU-1 has been removed from the EIS/EIR.

I8-39 The comment notes that drilling activities could require more than 30 days and requests that the text be revised to reflect that there is no time restriction on the days necessary to drill a well.

Upon further review of Chapter 2, Proposed Action and Alternatives, and in response to this comment, Section 4.18.4.1 of the Draft EIS/EIR (page 4.18-15, last paragraph) is modified as follows:

> **Construction-Related Drilling Effects.** During intermittent drilling activities, the periodic use of drill rigs in the wellfield would be visible from U.S. Highway 395, SR 203 and unpaved roads at foreground or middleground distances while drilling from any of the well sites in the ~~P~~Project area. Due to the large size of the approximately 175-foot high drill rigs, use of this particular piece of construction equipment would temporarily alter the existing quality and character of the p~~P~~roject area by introducing a tall structure to the area during drilling activities. Because this construction activity would be short-term (~~limited to a 30-day period~~approximately two months per well) and temporary, the drill rig structure would not permanently alter the existing visual quality and character of the p~~P~~roject area. Furthermore, comparable drilling activities have historically occurred in the area, the most recent…

I8-40 The comment states that the requirement for implementing landscaping improvements one year prior to construction, as described in Mitigation Measure VIS-1 (Landscape Plan), is not feasible. The comment also notes that there is no water in the Project area; thus water

would need to be trucked in. Additionally, the comment recommends that Mitigation Measure VIS-1 be revised such that the one year landscaping requirement prior to construction be deleted and replaced with language requiring that revegetation occur upon completion of construction.

Regarding the infeasibility of implementing this measure one year prior to construction, please refer to Response I8-36 for an overview of revisions to Mitigation Measure VIS-1. With respect to the comment noting that there is no water in the Project area, the commenter correctly notes that water would need to be trucked in for irrigation purposes. See Response I9-12.

I8-41 The comment correctly describes Mitigation Measure VIS-2 (Underground Pipeline Crossovers). The comment also notes that although the engineering design options described in Mitigation Measure VIS-2 are feasible, these options are more expensive than the design methods proposed as part of the Project. The comment recommends that landscaping be implemented at pipeline segments where one pipeline crosses over another. The commenter also correctly notes that the pipeline would be painted to blend in with the surrounding landscape.

See Response I8-37 for proposed revisions to Mitigation Measure VIS-2. Implementation of Mitigation Measure VIS-1 (Landscape Plan) at the locations where implementation of Mitigation Measure VIS-2 is required, would also further reduce adverse effects on visual resources.

I8-42 The commenter states that the County of Mono does not have jurisdiction over grading plans on public lands. In response to this comment, the following revisions have been made to the Draft EIS/EIR, Section 3.19, *Water Resources*, page 3.19-12, second paragraph under Section 3.19.2.3:

> Chapter 13.08 of the Mono County Code provides specifications and requirements relevant to land clearing, earthwork, and drainage facility installation, as relevant to projects installed within the county (this would not include USFS lands).

I8-43 The commenter states that well pads and pipelines are generally not impervious surfaces. Because of the proposed clearing, grading and compaction that would take place at each new well pad, these surfaces are considered impervious. Further, the plan-view surface areas of the pipelines are correctly considered to be impervious.

I8-44 The commenter included a letter from the GBUAPCD to the Mono County Community Development Department Planning Division on November 6, 2012, in response to the appeal of the M-1 Replacement Project EIR, as an attachment related to its Comment I8-10. The letter is noted and the commenter is referred to Response I8-10 for a discussion of why the attached letter is not relevant to the CD-IV air quality analysis.

Letter I9 – Responses to Comments from California Unions for Reliable Energy (CURE)

I9-1 The commenter summarizes their understanding of the CD-IV Project, provides an overview of the Project and its permitting requirements. This comment is noted.

I9-2 See Common Response 2, Recirculation in Section 6.4.3.

I9-3 This comment is a statement of interest and does not comment on the adequacy or accuracy of the Draft EIS/EIR with specific information. No response is required.

I9-4 The commenter provides a summary the environmental review process, NEPA and CEQA requirements, and references case law but does not comment on the adequacy or accuracy of specific Draft EIS/EIR components. This comment is noted.

I9-5 This comment alleges technical errors and information gaps but is insufficiently specific to allow for a detailed response. In regards to recirculation, see Common Response 2, Recirculation in Section 6.4.3.

I9-6 The Draft EIS/EIR includes a thorough and accurate project description at a sufficient level of detail that allows for a comparison of impacts among the proposed action and alternatives (40 CFR 1502.14(b)). In accordance with the BLM's NEPA Handbook (Section 6.5.1), the Draft EIS/EIR describes as part of the project description, who will undertaking the work, what will be done, how the work will be accomplished, when the work will occur, and where the various activities will take place for the proposed action and alternatives (see Chapter 2 of the EIS/EIR).

Section 2.2.6 of the Draft EIS/EIR describes the phased project development approach to the Project. The commenter (in Comment I9-7) incorrectly infers that potentially none of the wells drilled in Phase I would be used for production. The phasing information provided in Section 2.2.6 of the Draft EIS/EIR was the basis for analyzing the two project phase impacts.

Connected actions are those actions that are "closely related" and "should be discussed" in the same NEPA document (40 CFR 1508.25 (a)(1)). Actions are connected if they automatically trigger other actions that may require an EIS; cannot or will not proceed unless other actions are taken previously or simultaneously; or if the actions are interdependent parts of a larger action and depend upon the larger action for their justification (40 CFR 1508.25 (a)(i, ii, iii)). Connected actions are limited to actions that are currently proposed (ripe for decision). Actions that are not yet proposed are not connected actions, but may need to be analyzed in cumulative effects analysis if they are reasonably foreseeable.

The proposed CD-IV Project is both physically separated from the other Casa Diablo geothermal complex projects and similarly independent of the other projects. Each of the

neighboring geothermal developments comprising the Casa Diablo geothermal complex (MP-I, MP-II, PLES-I) is a separate project capable of independent operation (i.e., not connected actions). Further, the Draft EIS/EIR's treatment of the CD-IV Project as a separate project does not constitute "piecemealing" under CEQA. (see *Communities for A Better Environment et al v. City of Richmond, Chevron Products Company et al* (2010) 184 Cal. App. 4th 70).

The CD IV Project would share some common facilities (i.e., office space) to facilitate efficient utilization of the geothermal resource; however, the CD IV Project would not rely on any of the other projects' wells or pipelines. Each of the projects was independently developed and approved at different times and by different regulatory authorities. Each of the projects has a different and separate power sales agreement which could change independent of the other projects, and each of the projects could be sold to a third party independently from the other projects. Finally, if ultimately approved, each of these projects would proceed independently of the other and neither is dependent upon the other for any aspect of its construction or future operation.

Cumulative actions are proposed actions which potentially have a cumulatively significant impact together with other proposed actions and "should be discussed" in the same NEPA document (40 CFR 1508.25(a)(2)). In the Draft EIS/EIR, the MP-I, MP-II and PLES-I projects are appropriately evaluated as a cumulative projects.

I9-7 As discussed in Response I9-6, the CD-IV Project would not rely on existing wells utilized by the MP-I, MP-II, or PLES-I geothermal developments to generate the necessary flow, however, the CD-IV could use existing wells that have been drilled for exploration for the CD-IV Project (as indicated in the Draft EIS/EIR Section 2.2.4.1). The project phasing, as described in Draft EIS/EIR Section 2.2.6, indicates that up to six new geothermal wells would be drilled during the non-winter seasons until sufficient flow is obtained to achieve the OEC planned operating capacity. The assumption that sufficient flow would be available to sustain the operation of the Phase I OEC is based on the Applicant's proprietary well drilling and testing results for the existing exploratory wells, understanding of the geothermal system from operation of the existing geothermal plants, and modeling. The uncertainty surrounding the production capacity of individual wells to be drilled in the future does not affect the Draft EIS/EIR analysis of the Project's impacts to sensitive biological resources, air quality and water quality, as asserted in the comment. The Draft EIS/EIR conservatively assumes that all potential well sites will be developed to assess the Project's impacts. See Response I9-6.

I9-8 The commenter correctly asserts that Draft EIS/EIR did not specify the type of road improvements proposed. Because it is unknown which wells would be used for production versus injection, it is assumed for this EIS/EIR analysis that all 6.35 miles (10.2 km) of Project access roads would be plowed. Section 2.2.4.4, *Existing and Planned Access Roads*, has been clarified as follows:

An estimated 0.77 miles (1.24 km) of new permanent access roads would be constructed from existing roads to the well sites where proposed well pads are not immediately adjacent to existing roads. These new access roads would be 15 feet wide, with a turning radius of no less than 50 feet. Construction of these access roads would be accomplished by clearing brush and grading the surface to construct a roadway; gravel may be added as needed. All roads requiring all-weather access and snow plowing (those providing access to production wells) would require a hardened surface, which includes installation of aggregate, road base or paving. See Section 2.2.7.3, *Access Road Maintenance and Plowing*, for additional details on plowing and maintenance.

New access roads constructed or unauthorized routes that are reconstructed would be added to the National Forest Road system. All vehicle traffic associated with the CD-IV Project would be restricted to the designated access roads. To reduce the potential for hazards and to reduce dust generation, Project-related vehicles would be restricted to traveling no faster than 25 mph on Sawmill Cutoff Road (NFSR 03S08) and on other unimproved roads in the Project area.

In order to maintain the integrity of the road and minimize erosion, access roads for production wells would be constructed using a durable road surface (aggregate, road base or paving). In addition, drainage and other road improvements would be constructed, with review and approval by USFS and Mono County, as appropriate. Road base material would be installed and regularly maintained on all production well access roads to accommodate the need for winter plowing. Injection wells do not require year-round access and would not require installation of road base material. However, it is unknown which wells would be used for production versus injection, and therefore it is assumed for this EIS/EIR analysis that all 6.35 miles (10.2 km) of project access roads would be plowed and improved.

I9-9 The commenter states that Draft EIS/EIR contains no description or details of the proposed drainages, erosion control measures, or any analysis of the associated potentially significant impacts. Further, the commenter states that it is impossible to determine whether the Proposed Action and Alternatives are in compliance with Mammoth Lake General Plan and numerous other state and federal law governing waterways. Standards for drainage and erosion control measures related to construction and operation are described by the Construction General Permit and the USFS Water Quality Management Handbook, both of the which the Proposed Action and Alternatives would be required to comply with (see Section 4.19.4.1, *Water Resources, Direct and Indirect Impacts*). Further, several PDMs specifically target protection of water quality (see Section 4.19.2, *Applicant Proposed Project Design Measures*) and Mitigation Measure SW-1 describes specific design and performance criteria for the drainage features (see Section 4.19.9, *Mitigation Measures*). Potential impacts to water quality are addressed in the Draft EIS/EIR in Section 4.19.4.1, *Water Resources*, and the Proposed Action and Alternatives would comply with applicable State and federal laws governing water quality. In reference to the Mammoth Lake General

Plan, neither the Proposed Action nor Alternatives propose to channel existing intermittent streams through new culverts. See Response A5-6 and I9-6.

I9-10 See Response I9-6. The commenter states that the document contains a less than meaningful description of the CD-IV Project's parking areas for construction and asserts that Lead Agencies must specify where construction vehicles will be parked. Staging areas are described in Section 2.2.3.3, power plant general construction information and standards for staging areas are established in PDMS contained in Section 2.2.9, *Project Design Measures for Environmental Protection*, and 2.2.10, *Mitigation Measures*. Further, pursuant to Mitigation Measure TRA-1 in Section 4.16, the Coordinated Transportation Management Plan to be prepared by ORNI 50, LLC and Mono County will address parking along public roadways and staging areas for instances when multiple trucks arrive at work sites.

I9-11 See Response I9-6. The comment states that the Draft EIS/EIR does not describe the amount of water to be stored onsite for fire protection, where this water will be stored, or what constitutes a fire suppression system. The reader is directed Section 2.2.2, General Construction Information under the subheading "Source and Quantity of Water During Construction" for information on water needed for fire suppression during construction. See Section 2.2.7.6, *Power Plant*, for a discussion of fire suppression needed during operation of the CD-IV power plant. See Section 4.13.9 for a discussion of the Fire Protection and Prevention Plan in Mitigation Measure PHS-2 in Section 4.13.9 of the Draft EIS/EIR and PDMs HAZ 3-8.

I9-12 The commenter states that the document fails to identify the CD-IV Project's operation water demand. Section 2.2.7.6 has been amended on page 2-38 to indicate that there is no water demand during operation, as indicated in Section 3.12 on page 28 of Ormat's application to the BLM (ORNI 50 LLC, 2012).

Operational Water Demand

During operation of the CD-IV power plant, there would be no ongoing operational water needs.

I9-13 See Response I9-6 and Common Response 1, Decommissioning in Section 6.4.3.

I9-14 The commenter states that the Draft EIS/EIR does not satisfy NEPA and CEQA requirements with regards to the description of the existing settings. This is an introductory statement that is followed up with specific criticisms on a section by section basis. The commenter is referred to Responses I9-15 through I9-27.

I9-15 The comment generally states that the Draft EIS/EIR does not provide an adequate baseline for the analysis of impacts to mule deer. The comment states that both spring and fall migration should be examined due to the potential for variation in migration routes, and technical deficiencies in the mule deer studies performed by Paulus that make them unreliable. The commenter also state that the lead researcher does not meet the mule deer expertise requirements of the Mono County General Plan.

Numerous mule deer surveys and studies have been performed in the Project area over a multi-year period and are cited in the Draft EIS/EIR. In addition to deer track studies by Jim Paulus, studies by MACTEC Engineering and Consulting are summarized in the Draft EIS/EIR but are not acknowledged by the commenter. The 2011 MACTEC report entitled, *Geothermal Expansion Project, Mammoth Lakes, California, Deer Track-Count Survey Results*, as cited in the Draft EIS/EIR analysis, directly answers several of the expressed comments (e.g., page 4.4-17). This report cites CDFG sources who note that a portion of the Round Valley deer herd migrate through the Project area in late April through the third week of May, depending on snow conditions. The report indicates that there have been several deer surveys/studies in the Project area over the years that have included track counts, pellet counts, radio collar, and other methods. The most recent deer study was performed by Quad Knof in 2004. The MACTEC report cites the CDFG recommendation by Tim Taylor to perform deer track count surveys, and adequately describes the track-count methodology used in the study. The MACTEC study was led by Carter Schleicher, a Certified Wildlife Biologist with more than 34 years of wildlife management experience. Taken together, the MACTEC and Paulus studies provide a solid baseline from which to describe the potential impacts of the CD-IV Project on deer movement and habitat use. A CV for Jim Paulus can be found in attachment 1 to Appendix H.

I9-16 The commenter states that the Draft EIS/EIR does not accurately or adequately describe existing biological resources in the Project area. The commenter specifically asserts that the Draft EIS/EIR fails to provide adequate baseline data for the Jeffrey pine vegetation community. The commenter claims that the description of Jeffrey pine forest in the Draft EIS/EIR is limited to a single sentence. This comment is inaccurate. The description of Jeffrey pine forest is provided in Section 3.3.1.3 of the Draft EIS/EIR. No additional description of the environmental setting as it relates to Jeffrey pine forest is required.

I9-17 The commenter states that the Draft EIS/EIR does not adequately describe the area affected for special-status plants and wildlife. The commenter also states that baseline surveys have not been conducted for areas proposed for new access roads or buffer zones around the power plant, well sites, or transmission line. The commenter also states that protocol-level surveys were not conducted for special-status wildlife. The commenter's assertion is inaccurate and overlooks the tabular assessment of special-status species habitat in the Project area as it relates to each special-status species identified as potentially occurring in the Project vicinity (see Table 3.3.3, Section 3.3 and Table 3.4-1, Section 3.4 in the Draft EIS/EIR). The text of the Draft EIS/EIR provides a species-by-species description of the availability and quality of habitat for each potentially occurring species in the Project area (pages 3.3-9 through 3.3-11 and pages 3.4-4 through 3.4-17). Baseline surveys, including focused botanical surveys, have been conducted throughout the entire Project area, including proposed access roads and buffer areas. The Draft EIS/EIR was incorrect to state otherwise and corrections have been proposed to clarify this (see Response I3-10). Protocol-level surveys for each potentially-occurring special-status species are not required prior to the CEQA and/or NEPA review process. No additional description of the environmental setting is required as it relates to special-status species.

I9-18 The commenter states that the Draft EIS/EIR does not provide adequate baseline data on northern goshawk. The Draft EIS/EIR provides a summary of existing information on northern goshawk (pages 3.4-13, and 4.4-8 through 4.4-9) in sufficient detail to allow for CEQA- and NEPA-level analysis. Protocol-level surveys for each potentially occurring special-status species are not required prior to the CEQA and/or NEPA review process. No additional description of the environmental setting as it relates to northern goshawk is required.

I9-19 The commenter states that the Draft EIS/EIR fails to adequately describe the environmental setting for Sierra marten. The commenter also states that the impact analysis conclusion for marten is in conflict with existing literature and the Draft EIS/EIR's setting section. The Draft EIS/EIR provides a summary of existing information on Sierra marten (pages 3.4-16 and 4.4-11) in sufficient detail to allow for CEQA- and NEPA-level analysis. Protocol-level surveys for each potentially occurring special-status species are not required prior to the CEQA and/or NEPA review process. No additional description of the environmental setting as it relates to Sierra marten is required. However, to ensure that the Draft EIS/EIR is clear in its potential impacts to Sierra marten, the following revisions have been made to the Draft EIS/EIR, Section 4.4, *Biological Resources – Wildlife*, page 4.4-11, fourth paragraph under Section 4.4.4.1:

> **Sierra marten.** Suitable marten habitat exists in the northwestern portion of the study area in the mixed conifer area of Jeffrey pine. However, the~~The~~ majority of the Jeffrey pine stands within the study area provide marginal quality habitat for marten due to the relative lack of snags, downed logs and large trees. Marten tracks have been seen in the vicinity of the Shady Rest Park and in association with the Jeffrey pine stands. Photo point studies of the Rhyolite area have detected marten in the area to the north of the study area. However, the lack of dense, multi-storied, multi-species late seral conditions (abundant downed logs, snags and large diameter trees) make it unlikely marten use the area for denning, resting and/or sustained foraging, except for the northwestern portion of the study area.

I9-20 The commenter states that the Draft EIS/EIR fails to adequately describe the environmental setting for greater sage-grouse. The Draft EIS/EIR provides a summary of existing information on greater sage-grouse (pages 3.4-13 through 3.4-14, and 4.4-10) in sufficient detail to allow for CEQA- and NEPA-level analysis. Protocol-level surveys for each potentially occurring special-status species are not required prior to the CEQA and/or NEPA review process. Pursuant to discussions with the BLM, the environmental setting for the greater sage-grouse has been amended as follows:

In Table 3.4-1, on page 3.4-9, the potential of sage-grouse to occur in the Project area has been corrected to read:

> ~~Moderate~~ Low – The Project area is dominated by Jeffrey pine forest with a patchy sagebrush understory. While the CD-IV Project is within the range of the greater sage-grouse, they generally avoid forested habitats such as those in the Project

area. ~~Marginal habitat exists in the Project area and is within species known range. Known occurrence from just south of Project area.~~

The following changes were made to the discussion of the greater sage-grouse starting on page 3.4-15:

Habitat and Biology: Sage-grouse are dependent upon sagebrush ecosystems year-round and in all stages of their life cycle, and require a variety of microhabitats within that ecosystem. Sagebrush, forbs, and insects are important foods. Leks (mating sites) are in areas of low and/or sparse vegetation; most mating occurs March-May in Long Valley, with nesting and brood rearing through July. In the Bi-State area, 95 percent of nest sites are within 3.2 miles of leks (Coates et al., 2012). ~~Nest sites have been found to be characterized by a higher percent shrub cover than in other parts of the species' range; and, also in contrast to other regions, understory vegetation was not an important factor in nest site selection, and nest survival increased with increasing cover of shrubs other than sagebrush (Kolada et al. 2009).~~ Females with broods selected areas with more perennial forbs and higher plant species richness, and avoided areas encroached by juniper and pinyon; the probability of fledging a brood increased as females selected habitats with greater densities of perennial forbs and more meadow edge (Casazza et al. 2011). Though sage-grouse ~~were~~ habitat was mapped in the regional project area in the 2012 Bi-State Greater Sage-grouse Preliminary Priority Habitat Map[1], the gross-scale mapping effort included forested habitats, which do not support sage-grouse activity (Schroeder et al., 2004).[2]

Status in Project Site: Though they are present in the regional area, the Jeffrey pine forest habitat in the Project area precludes the presence of sage-grouse. Sage-grouse habitat includes understory vegetation types that occur in the Project area, such as sagebrush, perennial grassland, and bitterbrush; however, this species actively selects against forested habitat and sagebrush habitat that is located adjacent to forested lands, possibly because forest habitats support predatory raptors that prey on sage-grouse (Walker, 2010). Even though sage-grouse have been observed approximately 0.25-mile from the Project site's southern edge, the presence of interspersed Jeffrey pines and the lack of herbaceous cover makes the Project area unsuitable based on the current understanding of habitat use and avoidance by this species. ~~The Project site contains suitable habitat for sage-grouse with sagebrush, perennial grasses and bitterbrush being the predominant vegetation. The potential sage-grouse habitat is of marginal quality due to the low density of the sagebrush, the presence of interspersed Jeffery pines and the lack of herbaceous cover. Grouse have been seen within a 0.25 mile distance from the Project site's southern edge.~~

[1] http://www.ndow.org/wild/conservation/sg/literature/Bi-State_Priority_Hab_2012.pdf. (Bi-State TAC, 2012b).

[2] http://www.blm.gov/pgdata/etc/medialib/blm/ca/pdf/bishop/sagegrouse.Par.77444.File.dat/SGDist_Schroeder_etal_2004.pdf

The discussion of sage-grouse in Section 4.4, starting on page 4.4-10, has also been altered to read:

> **Greater sage-grouse.** The study area ~~contains~~ does not support suitable habitat for sage-grouse, ~~with~~ as the sagebrush, and grassland understory in the Project area is generally located beneath Jeffrey Pine forest, or is located proximal for forested lands that grouse actively avoid. ~~perennial grasses and bitterbrush being the predominant vegetation. The potential sage-grouse habitat is of marginal quality~~ Relatively open, non-forested areas support marginal quality habitat due to the low density of ~~the~~ sagebrush, the presence of interspersed Jeffrey pines and the lack of herbaceous cover. Sage-grouse typically prefer dense, contiguous stands of sagebrush with ~~little to~~ no forest overstory. Grouse have been observed within a 0.25-mile distance from the study area's southern edge. Surveys for possible sage-grouse nest and lek sites were conducted in June 2010. No signs of sage-grouse were observed during these surveys. Habitat modifications, especially those associated with the U.S. Highway 395 and SR 203 corridors and the existing Casa Diablo Geothermal Complex, have reduced the likelihood that sage-grouse use the scrub habitats available in the study area.
>
> …Under the Proposed Action, no direct impacts to sage-grouse or their habitat are anticipated during construction ~~of the pipelines and some of the well pad sites would occur due to the permanent loss of potential (but marginal) nesting and foraging habitat~~. In the unlikely case that sage-grouse are present at the time of construction, ~~Construction~~ activities may result in some increased disturbance to sage-grouse such as displacement during foraging. However, direct effects to nesting sage-grouse ~~would be minimal~~ are not expected because sage-grouse actively avoid the habitat types that are available in the Project area ~~due to the marginal quality and limited availability of suitable nesting habitat in the study area~~. Sage-grouse nest sites and leks have not been found during surveys for the CD-IV Project.
>
> …Although no sage-grouse or sage-grouse nests or leks have been found within the study area, the implementation of **Mitigation Measure WIL-7** will ensure that ~~no active nests or leks are~~ sage-grouse are not affected by the Project.

I9-21 The commenter states that the Draft EIS/EIR fails to adequately describe the environmental setting for Sierra Nevada red fox and Pacific fisher. The commenter also states that the applicant failed to conduct the required species-specific surveys and that no baseline information regarding these species is included in the Draft EIS/EIR. The Draft EIS/EIR provides a summary of existing information on Sierra Nevada red fox (pages 3.4-17 and 4.4-12) in sufficient detail to allow for CEQA- and NEPA-level analysis. Pacific fisher is discussed in Table 3.4-1 (page 3.4-10). Because it was determined that Pacific fisher had a "low" potential to occur in the Project area, this species was not discussed further. Protocol-level surveys for each potentially occurring special-status species are not required prior to

the CEQA and/or NEPA review process. No additional description of the environmental setting as it relates to Sierra Nevada red fox or Pacific fisher is required.

I9-22 The commenter states that the Draft EIS/EIR fails to adequately describe the environmental setting for pallid bat. The commenter cites inconsistencies in the potential for the pallid bat to occur on the Project site with particular regard to its potential roosting habitat. The Draft EIS/EIR provides a summary of existing information on pallid bat (pages 3.4-14 through 3.4-15, and 4.4-10 through 4.4-11) in sufficient detail to allow for CEQA- and NEPA-level analysis. However, to clarify this species potential to use the Project site as roosting habitat, the following revisions have been made to the Draft EIS/EIR, Section 4.4, *Biological Resources – Wildlife*, page 4.4-10, fifth paragraph under Section 4.4.4.1:

> **Pallid bat and Townsend's big-eared bat.** Suitable Townsend's big-eared bat roosting habitats such as cliffs ~~(pallid bat)~~ and caves ~~(Townsend's big-eared bat)~~ are not found within the Project area. However, suitable pallid bat roosting habitat exists in the Jeffrey pine forest along the northern portion of the Project area. ~~pallid bat may utilize the Jeffrey pine forest along the northern boundary of the project site for roosting habitat.~~ While focused bat surveys have not been performed in the Project area, ~~N~~no known bat roosts occur within or adjacent to the Project area~~Proposed Action~~. In the absence of focused surveys to establish the absence of pallid bats, roosting is presumed within suitable habitat. ~~Under the Proposed Action,~~ Thus, construction activities may result in direct effects to roosting pallid bats, including the removal of roosting. **Mitigation Measure WIL-8** will be implemented to reduce impacts to roosting pallid bats.

In response to this comment, the following mitigation measure has been added to the Final EIS/EIR, Section 4.4, *Biological Resources - Wildlife*:

> **Mitigation Measure WIL-8: *Conduct Pre-construction Bat Surveys.*** If construction, grading or other Project-related activities are scheduled during the breeding season of native bat species (April 1 to August 31), pre-construction surveys shall be conducted prior to the initiation of construction by a qualified wildlife biologist to determine whether active roosts are present on site or within 50 feet of Project activities. Field surveys shall be conducted early in the breeding season before any construction activities begin, when bats are establishing maternity roosts but before pregnant females give birth (April through early May). If no roosting bats are found, then no further mitigation is required. If roosting bats are found, then disturbance of the maternity roosts shall be avoided by halting construction until the end of the breeding season or a qualified bat biologist removes and relocates the roosting bats in consultation with CDFW.

I9-23 The commenter states that the Draft EIS/EIR fails to adequately describe the existing setting for Owens tui chub. Specifically, the commenter states that the Draft EIS/EIR fails to include baseline information regarding the Owens tui chub population in the Hot Creek Headsprings; fails to include hydrologic data to establish existing conditions; and fails to

provide information on existing habitat conditions that influence Owens tui chub populations. The Draft EIS/EIR provides a thorough summary of existing information on Owens tui chub (pages 3.4-12, and 4.4-13 through 4.4-14) in sufficient detail to allow for CEQA- and NEPA-level analysis. In addition, the Draft EIS/EIR provides a thorough summary of existing information on both groundwater (Section 3.7) and surface water (Section 3.19). The Draft EIS/EIR explains that there is no Owens tui chub habitat in the Project area.

I9-24 The commenter states that the Applicant's wetlands study cannot be relied upon due to the unknown qualifications of the study's preparer as well as the fact that it has not been verified by the USACE. Verification by the USACE of the extent of wetland and Waters of the U.S. on a site is not required prior to CEQA and NEPA analysis. The commenter further states that the wetland study does not necessary reflect the total extent of jurisdictional wetlands in the Project area because data on soils and hydrology were not recorded. This statement is inaccurate. Data for soils and hydrology was recorded for the Paulus wetland study. A CV for Jim Paulus can be found as Attachment 1 to Appendix H.

I9-25 The commenter states that the Draft EIS/EIR is incorrect in its description of the Riparian Conservation Area corridors in Upper Basalt and Basalt Canyon, specifically in regard to stream channels. In response to this comment, the following revisions have been made to the Draft EIS/EIR, Section 3.3, *Biological Resources – Vegetation*, page 3.3-18, second paragraph under Section 3.3.1.6:

> The RCA corridors mapped in the Upper Basalt and Basalt Canyon areas do not support riparian habitats ~~or stream channels~~.

I9-26 The commenter states that the Draft EIS/EIR fails to disclose the extent of other waters, including waters of the State and aquatic habitats subject to regulation under Section 1602 of the Fish and Game Code. Project facilities were <u>located and designed to avoid direct impacts to wetlands and waters of the US. A number of pipeline corridors span potentially jurisdictional wetlands and aquatic habitats near the existing Casa Diablo facility (see Figure 3.3-3). However, pipelines in these areas will span all potentially jurisdictional features and no supporting structures will be placed within potentially jurisdictional features. This will avoid any direct impacts to waters of the State</u> and aquatic habitats subject to regulation under Section 1602 of the Fish and Game Code.

I9-27 The comment is a concluding statement. The commenter is directed to Responses I9-14 through I9-26.

I9-28 The commenter states that the Draft EIS/EIR did not consider all of the CD-IV Project's significant impacts to air quality, biological resources, water resources and hazardous materials, among others but does not specifically indicate how the Draft EIS/EIR is deficient. This is an introductory statement that is followed up with specific criticisms on a section by section basis. The commenter is referred to Responses I9-29 through I9-56 for responses to specific concerns. The commenter is also referred to impact analyses in

Sections 4.2 *Air Quality*, 4.3 *Biological Resources-Vegetation*, 4.4 *Biological Resources-Wildlife*, 4.13 *Public Safety, Hazardous Materials and Fire*, and 4.19 *Surface Water*, and Common Response 2 Recirculation in Section 6.4.3.

I9-29 The comment is a summary statement that the review agencies failed to adequately analyze and undertake a hard look at all of the Project's air quality impacts and the Draft EIS/EIR failed to provide effective and feasible mitigation or disclose all of the Project's air quality impacts. The specific comments to support the statement are addressed in subsequent responses.

I9-30 The commenter indicates that the Draft EIS/EIR underestimates construction combustion exhaust emissions due to an inconsistent portrayal of drill rig operation hours, and because it is assumed that the drill rig engines would meet Tier 2 standards.

Regarding drill rig operation hours, the commenter appears to have misinterpreted the drill rig hours of operation data provided in Draft EIS/EIR Appendix C. To clarify, the air resources analysis assumes that each drill rig would contain three 1,354-hp engines that would each operate five hours per day, as well as one 197-hp engine that would operate one hour per day, for a combined total of 16 hours per day per drill rig. For the maximum day regional emissions scenario, it is assumed that drilling would occur simultaneously at two separate well sites for a combined maximum total of 32 hours per day (see Appendix C, *Onsite Equipment Usage for Well Development* on page C-5 and *Maximum Day Onsite Well Development Construction Exhaust Emissions* on page C-7).

Regarding the drill rig engines, subsequent to the release of the Draft EIS/EIR, the Applicant has confirmed that Tier 2 and Tier 3 engines would be used on the drill rig(s) (ORNI 50, LLC, 2013). To formalize this commitment, Mitigation Measure AQ-2 has been added to the Draft EIS/EIR. Accordingly, the last full paragraph on Draft EIS/EIR page 4.2-9 has been revised as follows:

> ~~Because the maximum daily NO_x emissions shown in Table 4.2-3 are primarily related to well drilling activities using drill rigs that would meet USEPA and CARB Tier 2 standards for off-road engines, there is no further feasible NO_x emission control technology that can be applied to the drill rigs. However, i~~ Implementation of **Mitigation Measure AQ-1**[2] would reduce NO_x exhaust emissions associated with mobile off-road equipment (e.g., dozers, graders, loaders, etc.) by approximately 20 percent. This would reduce the maximum day NO_x emissions by approximately 19 pounds. In addition, **Mitigation Measure AQ-2** commits the Applicant to using drill rig engines that meet Tier 2 or higher emissions standards; however, the daily significance threshold used for this analysis would still be exceeded.

2 See Section 4.2.9 for all mitigation measures.

Mitigation Measure AQ-2 has been added to Section 4.2.9, *Mitigation Measures*, on Draft EIS/EIR page 4.2-20 as follows.

> **Mitigation Measure AQ-2:** ORNI 50, LLC shall require that all drill rig engines meet either USEPA and CARB Tier 2 or higher emissions standards for off-road engines. Prior to commencement of drilling, ORNI 50, LLC shall provide documentation to GBUAPCD that demonstrates that each drill rig will be equipped with Tier 2 and Tier 3 engines.

I9-31 The commenter indicates that the Draft EIS/EIR should be revised to include a dispersion model for the spread of gaseous sulfur compounds. It is estimated that noncondensible gas released from the geothermal fluid would have a relatively low concentration of H_2S relative to public health and safety (refer to Response I4-1 for representative data of measured noncondensible gases). In addition, Mitigation Measure AQ-4 has been added to the Draft EIS/EIR to ensure that potentially hazardous emissions concentrations related to release of H_2S during well testing are adequately controlled. See Response A8-6.

I9-32 The commenter indicates that there are feasible mitigation measures available to reduce fugitive n-pentane emissions beyond the best available technology proposed for the CD-IV Project. The commenter also lists the Applicant's proposed emission reduction concepts and technologies. This comment is noted.

The commenter indicates that the CD-IV Project's motive fluid system should use leakless technology to avoid fugitive emissions of n-pentane. The proposed motive fluid system does include limited leakless technology, including welded connections wherever feasible and practical (Ormat 2013). For example, pipeline runs, elbows, and transitions would be welded. Leakless technology would not be feasible or practicable for some components of the motive fluid system. For example, valves would be flanged in case they would ever need to be replaced and instrumentation would need to be threaded to allow for calibration and/or replacement.

The commenter also indicates that the Draft EIS/EIR should be revised to require USEPA leak detection and repair methods. The Permit to Operate would include monitoring requirements per USEPA regulatory methods, including Reference Method 21. The exact terms and conditions of the Permit to Operate the plant would not be identified until after Project approval; therefore, it is appropriate for the EIS/EIR to identify binding mitigation that will be consistent with the requirements of the permit to ensure that leak detection monitoring is conducted per USEPA methods. Mitigation Measure AQ-6 has been added to Section 4.2.9, *Mitigation Measures*, on Draft EIS/EIR page 4.2-20 (see Response I9-172 for new Mitigation Measure AQ-6).

I9-33 The comment states that the Draft EIS/EIR does not adequately address the transportation of motive fluid to the site. The Draft EIS/EIR Section 3.13.2 outlines applicable regulations and oversight agencies for the transportation of hazardous substances. As discussed in Section 4.13.4.1, compliance with these existing regulations for the routine transportation

of hazardous materials, including n-pentane, would be sufficient to address the potential hazard associated with its transportation. One truck delivery of n-pentane per year is anticipated (ORNI 50, LLC, 2013). An off-site consequence analysis using USEPA's RMP is not warranted in order to disclose potential impacts to public health and the environment.

I9-34 The comment is an introductory statement and it is understood that further elaboration is forthcoming in subsequent comments. No additional response is necessary.

I9-35 The commenter states that the Draft EIS/EIR does not take a "hard look" at several issues pertaining to deer tolerance of noise and human activity and how deer would respond to new barriers associated with the Project during construction and operation. The 2008 BLM NEPA Handbook (Section 6.8.1) directs that NEPA effects analysis must demonstrate that the BLM took a "hard look" at the impacts of the action, meaning that, "the level of detail must be sufficient to support reasoned conclusions by comparing the amount and the degree of change (impact) caused by the proposed action and alternatives." The Draft EIS/EIR analysis relied upon current scientific research and focused evaluations of available deer habitat and movement in presenting the effects conclusions that were reached. The Draft EIS/EIR conclusions that noise and activity from the CD-IV Project would not adversely affect deer populations over the long-term and that deer are likely to adapt to new barriers was based on focused migratory deer studies that have occurred in the Project area. The commenter is correct that changes to the built-out landscape would change the way deer move through the area. However, the Draft EIS/EIR analysis differs from the commenter's opinion in that former analysis concludes that deer will adapt to Project-related environmental changes and continue to use the Project area in a manner similar to pre-project conditions. This opinion is supported by several technical reports that were prepared for the Project. Paulus (2012a) states that:

> "… the tendency (of deer) to use the only overhead pipe available within the habitat type chosen for migration strongly supports the hypothesis that passages provided for migration will be used regularly in the years soon after pipeline completion. Deer use of this unintentional, rather cramped overhead bodes well for any intention to provide overhead-style passages for migrating deer that might be included in the upcoming CD4 Project."

In the case of the CD-IV Project, vertical expansion loops would be reduced or eliminated and underground segments would be provided at regular intervals to provide deer passage (see Response I3-9). The Draft EIS/EIR analysis concludes that deer regularly traverse pipeline alignments and that deer make use of available overhead segments; therefore, the analysis found substantial evidence supporting the conclusion that deer would continue to utilize habitat in a similar manner following Project construction, and deer would readily adapt to undergrounded pipeline segments that would be less impacting than overhead segments.

With regard to deer tolerance of noise and human activity, Paulus (2012a) concluded that human activity and operational lighting and noise associated with power plant operation,

power plant decommissioning, and storage yard activities could possibly discourage deer use of the corridor between MP-I and MP-II/PLES-I for nightly movement to water. He concludes that such effects could be minimized by shielding night lighting, measures to avoid attracting potential predators (e.g., proper storage of trash), and adding an additional deer passages, all of which were incorporated into the Project design, PDMs (e.g., PDM Bio-1), and Project mitigation (Mitigation Measures WIL-4, WIL-5, WIL-6, WIL-7). Paulus (2012b) also notes that, "(m)embers of the resident deer population in summer and early fall 2011 used habitats that are available near existing facilities in the proposed Project area uniformly, indicating adaptation (to power plant noise and activity)."

In response to the portion of the comment which states that project mitigation should incorporate remote cameras or other specialized techniques to study mule deer movement, see Response I14-40, which revises the components of the Migratory Deer Monitoring Plan required by Mitigation Measure WIL-6.

A portion of the comment states that Draft EIS/EIR mitigation measure WIL-4, which states that a new deer crossing over the pipeline will resemble the existing crossing at the SCE easement, does not guarantee that the deer will use the easement. As described in Response I3-9, the identified crossing will be undergrounded. The location of undergrounded segments is presented in the Draft EIS/EIR (see Figure 4.4-2, Figure 4.4-3, and Figure 4.4-4).

The comment states that the lack of performance criteria in Draft EIS/EIR Mitigation Measure WIL-6 makes it impossible to determine the trigger for remedial action. As described in Response I14-40, the revised Mitigation Measure WIL-6 includes performance criteria for deer population monitoring.

I9-36 The commenter states that the Draft EIS/EIR fails to adequately identify and analyze the potential for the Project to yield increased mortality in mule deer resulting from vehicle collisions. Mule deer and vehicle collisions are adequately discussed in the Draft EIS/IER (see pages 4.4-16 and 4.4-17).

I9-37 The commenter states that the Draft EIS/EIR fails to include a "hard look" analysis of project impacts to Owens tui chub and the Hot Creek Hatchery. Potential impacts to Owens tui chub and the Hot Creek Hatchery from operation of the Proposed Action and Alternatives are discussed and considered in the Draft EIS/EIR (pages 4.4-8, 4.4-13, 4.4-14, and 4.4-19). See Response A9-2.

I9-38 The comment title suggests that the Draft EIS/EIR fails to disclose a potential violation of the federal Endangered Species Act; however, the substance of the comment simply summarizes the federal consultation process.

As discussed in Draft EIS/EIR Section 6.2.3, *Endangered Species Act* (page 6-4), the BLM will consult with the U.S. Fish and Wildlife Service (USFWS) and satisfy all requirements of the federal Endangered Species Act after the selection of a preferred alternative.

I9-39 The comment correctly states that the BLM must consult with the USFWS to satisfy the requirements of the federal Endangered Species Act. However, the USFWS only consults with a federal lead agency on a single preferred alternative, as opposed to the suite of different alternatives that must be reviewed under NEPA and CEQA. For that reason, consultation with the USFWS often occurs after the selection of a preferred alternative. As identified in Draft EIS/EIR Section 6.2.3, *Endangered Species Act* (page 6-4), the BLM and USFWS are preparing a biological assessment to determine the need for consultation with the USFWS. If the Resource Agencies identify potential effects to listed species, consultation with the USFWS will be required to satisfy the requirements of the federal Endangered Species Act.

I9-40 The commenter states that the Draft EIS/EIR fails to disclose, analyze and mitigate significant impacts from noise on biological resources. The Draft EIS/EIR adequately discusses potential impacts to wildlife due to increases in noise that are associated with the Project in Section 4.4, *Biological Resources - Wildlife*. The analysis identifies that a potential effect could occur to wildlife; however, the mechanism and magnitude of the potential effects cannot be known, particularly because design, and avoidance and minimization measures would reduce the magnitude of the effect. Project noise that is generated during construction and operations would be minimized though the implementation of Mitigation Measure NOI-1 through NOI-3, which are sufficient to minimize potential noise impacts to wildlife. In addition, see Responses I3-3 and I3-4.

I9-41 The comment states that the Draft EIS/EIR inadequately analyzes impacts from soil stabilizers. In response to this comment, the following text changes are made to the Draft EIS/EIR:

On page 2-52 and page 4.2-20:

> **Mitigation Measure AQ-3:** ORNI 50, LLC shall develop a fugitive dust control plan to be implemented during construction of the Proposed Action. The plan shall be submitted to the GBUAPCD for review and approval prior to the commencement of construction activities. The plan shall include, but not be limited to the following dust control measures:
>
> 1. All on-site unpaved roads and off-site unpaved access roads shall be effectively stabilized to control dust emissions using water~~ or chemical stabilizer/suppressant~~.

On page 2-54 and page 4.3-20 as part of **Mitigation Measure VEG-2: Weed Management Plan**:

> b. Site Soil Management: Ground disturbance shall be limited to the minimum necessary for construction activities, using dust suppressants to minimize the spread of seeds. Disturbed vegetation and topsoil shall be re-deposited at or near the removal area to eliminate the transport of soil-borne noxious weed seeds, roots, or rhizomes. Areas of topsoil removal should be surveyed for

weeds pre-project. If weeds are present, topsoil should not be re-used for revegetation purposes. BLM-approved dust suppressants (e.g., water ~~and/or palliative~~) shall be minimized on the site as much as possible, but shall be used during construction to minimize the spread of airborne weed seeds, especially during very windy days.

I9-42 The commenter states that the Draft EIS/EIR fails to disclose, analyze and mitigate impacts to northern goshawk. The Draft EIS/EIR adequately discusses potential impacts to northern goshawk associated with the Project (pages 4.4-8 through 4.4-.10). Potential impacts to northern goshawk are mitigated through implementation of Mitigation Measure WIL-1 and WIL-2.

I9-43 The commenter states that the Draft EIS/EIR fails to analyze and mitigate impacts to greater sage-grouse. The Draft EIS/EIR adequately discusses potential impacts to greater sage-grouse associated with the Project (page 4.4-10). Potential impacts to greater sage-grouse are mitigated through implementation of Mitigation Measure WIL-7.

I9-44 The commenter states the Draft EIS/EIR fails to identify and address the Project's potentially significant impact on trees. In particular, the commenter states that tree kills are linked to geothermal power production activities and that this effect is documented in at the Casa Diablo geothermal complex. The USGS has documented tree kills related to carbon dioxide releases at the Long Valley Caldera. The tree kills are located at long-recognized areas of weak thermal fluid upflow. The USGS found that these tree kill areas have expanded in recent years, "possibly in response to geothermal fluid production at Casa Diablo." (USGS, 2011) While the link between geothermal fluid production and tree kills is hypothesized by the USGS study, the correlation between geothermal fluid production and tree kills is not completely established.

I9-45 This comment questions the reliability of the forecast reductions of thermal outflow at the Fish Hatchery Springs which were reported in the Draft EIS/EIR on page 4.7-7 as "about 17 percent" and in Appendix D on page 42 as "could be a ~17% decline in thermal water input." In response to this comment, the following text change to Appendix D, page 42 has been made:

> The potential impact at the Fish Hatchery springs ~~could be ~17%~~ would be an estimated 17 percent decline in thermal water input.

I9-46 The comment states that the Draft EIS/EIR does not provide evidence to support the statement that the thermal water fraction of input to Hatchery Springs is less than 5 percent of the total discharge or explain the concept of conductive buffering. See Response I14-22.

The commenter asserts the Draft EIS/EIR does not include an independent review of the modeling estimates for the reservoir temperature and pressure declines. As stated on page 4.7-4 of the Draft EIS/EIR, the proprietary numerical model used to simulate geothermal production and predict reservoir response was subject to independent technical review by SAIC, Inc., to evaluate its validity for analyzing environmental impacts of the

CD-IV Project. The Draft EIS/EIR adequately evaluates geothermal model and its predictions.

I9-47 Please refer to Common Response 4, Hydrologic Monitoring in Section 6.4.3.

I9-48 The Draft EIS/EIR, Section 4.7.4.1, adequately evaluates the Project's potential impacts on downgradient resources from predicted temperature and pressure declines and no mitigation measures are warranted. See also Common Response 4, Hydrologic Monitoring in Section 6.4.3 and Responses I14-22 through I14-24.

I9-49 This comment asserts that the Draft EIS/EIR fails to identify potential impacts on surface water quality from accidental motive fluid release. As stated in Appendix D of the Draft EIS/EIR (page 30), fluid leaks are rare in binary generation systems, although several short-term leaks have introduced small amounts of isobutane into the spent geothermal brine, which have been detected in trace amounts in wells, thermal springs and steam vents. As further discussed, isobutane is a non-toxic gas with a very low solubility in water, therefore, it will strongly fractionate into the vapor phase. Historic sampling detected isobutane primarily in fumaroles and the gas phase in bubbling hot springs, not surface water. Because isobutane readily vaporizes, its concentration rises rapidly after a leak and then falls off exponentially with time (Evans, et al, 2004) as it is removed from the system. The potential impact of inadvertent motive fluid releases on fish and wildlife habitat within the Project area, in particular the Owens tui chub at the Hot Creek Fish Hatchery, is low given the trace concentrations detected to date in sampling at nearby geothermal features, the small contribution (less than 5 percent) of thermal water to the total outflow to Hatchery Springs (Draft EIS/EIR page 4.7-7), and the low solubility of isobutane in water. The potential for inadvertent leaks in the future would be minimized by adherence to hazardous materials storage and use regulations outlined in Draft EIS/EIR Section 3.13.2, including implementation of a Risk Management Plan for N-pentane storage and use. Also see Response I9-167.

I9-50 The comment states that "injection fluid, including spent brine and other chemical additives, can move downgradient with the flow of groundwater to degrade groundwater and interconnected surface [water] bodies, including springs." Injection fluid is, by definition, spent brine, which is the same as the natural source brine in the geothermal aquifer and related surface manifestations, and thus does not create an impact by its downgradient flow. As discussed in the Draft EIS/EIR Section 3.13.1, within the existing wellfield, anti-scalant is used at only two of the existing wells. The Draft EIS/EIR page 3.13-2 is revised to correct this information:

> Within the wellfield, a 55-gallon container of lubricating oil is stored at each production well. Anti-scalant is also used at ~~two~~ one of the existing wells. Currently well 57-25 uses a scale inhibitor at a usage rate of 1500 gallons per year.

Because the brine in the Long Valley geothermal system has a demonstrated low potential for scale precipitation, the anticipated type and relative quantity of chemical additives to

manage biofouling, corrosion, or scaling for the CD-IV Project would be similar. Because the CD-IV is expected to increase existing geothermal production in the reservoir by 50 percent, one may reasonably conclude that the use of scale inhibitor would increase by 50 percent, requiring approximately 750 gallons per year, or 2 gallons per day. At the estimated production rate of 6,000 gallons per minute, over 8 million gallons of spent brine would be reinjected daily. The addition of 2 gallons per day within this volume of injectate would have a negligible effect on the composition of the spent brine, and consequently, on downstream water quality.

I9-51 The comment states that the Draft EIS/EIR does not identify the chemicals that will be used during well drilling and construction to enhance production or injection of geothermal fluids. The Draft EIS/EIR Section 3.13.1.1 identifies hazardous materials that would be used during geothermal well drilling and construction as fuels, lubricants and solvents, as well as drilling mud additives such as gel, polymers and slurry (that may contain small quantities of crystalline silica). To provide further information in response to this comment, the following is added to the Draft EIS/EIR on page 3.13-2:

> These drilling additives include the following: barite (barium sulfate); Portland cement (calcium silicates); Drispac Polymer; ground almond shell fiber seal; bentonite clay; gypsum; silicate powder, aluminum silicate, and crystalline silica.

These drilling additives are routinely used for the drilling of geothermal wells and water wells and do not pose a significant hazard to water quality or the environment. As discussed in Draft EIS/EIR Section 4.13.4, geothermal well drilling would be conducted in accordance the BLM well drilling permit and construction best management practices under the SWPPP. Best management practices would include secondary containment of onsite hazardous materials storage areas, containment basins for drilling muds and stormwater runoff, and other management strategies that would minimize the potential for inadvertent spills and leaks of chemicals used during construction

I9-52 The comment claims that the potential for leakage of well drilling chemicals is not addressed. As discussed in above in Response I9-51, the potential for leakage was addressed in the Draft EIS/EIR.

I9-53 The comment claims that the Draft EIS/EIR does not address potential water quality impacts from brine injection activities. Refer to Response I9-50.

I9-54 The commenter states that the Draft EIS/EIR fails to properly identify, analyze and mitigate the Project's potentially significant impacts on jurisdictional wetlands and waters of the U.S. See Response I3-19.

I9-55 The commenter states that the Project will require a Section 404 Permit for the USACE, and further states that this needs to be disclosed and analyzed in the Draft EIS/EIR. The Project will not result in direct impacts to potentially jurisdictional wetlands or waters of the U.S. Therefore a Section 404 permit will not be required. See Response I3-19.

I9-56 The commenter states that the new roads and associated drainage features would require an NPDES permit and runoff from these features would otherwise qualify as an unpermitted point source. Project construction activities, including the installation of new roads and associated drainage features, would indeed be subject to and comply with the Construction General Permit (which is an NPDES general permit). After Project construction, an NPDES permit would only be required for the discharge of pollutants from point sources to waters of the U.S; point sources do not include features such as new roads and the Project would not discharge pollutants toWaters of the U.S.

The issue of potential polluted stormwater runoff is addressed explicitly in the Draft EIS/EIR (see Section 4.19.4.1, *Direct and Indirect Impacts*). Stormwater runoff from construction areas would be regulated by the provisions of the Construction General Permit. A number of PDMs and mitigation measures also address this issue directly (HYD-1, HYD-3, HYD-5, HYD-6, and SW-1). It was determined that the Proposed Action and Alternatives would have a less than significant impact with respect to violating water quality standards and providing additional sources of polluted runoff. Further, PDM HYD-5 and Mitigation Measure SW-1 require energy dissipation features to be incorporated into stormwater drainage features, and the runoff would not be discharged directly to any receiving waters. An individual NPDES permit would not be required of the Proposed Action and Alternatives with respect to stormwater runoff.

I9-57 The commenter summarizes the requirements of NEPA and CEQA to mitigate potentially significant impacts and for discussing such impacts. The comment does not identify specific inadequacies in the Draft EIS/EIR and therefore does not allow for an individual response. See Response I9-58 through 66 for resource specific responses. This comment is noted.

I9-58 The commenter states that the proposed mitigation measures concerning water quality are inadequate. The mitigation measures presented in the Draft EIS/EIR (see Section 4.19.9, *Mitigation Measures*) are adequate and would reduce potential water quality impacts to a less-than-significant level.

I9-59 The commenter states that Mitigation Measure SW-1 (requiring a Comprehensive Site Drainage and Runoff Management Plan) improperly defers the formulation of adequate mitigation measures. The Comprehensive Site Drainage and Runoff Management Plan is an acceptable mitigation measure, providing adequate detail and performance criteria. It would be completed prior to construction of the Proposed Action and Alternatives; the requirement for the drainage plan does not qualify as deferred mitigation. Mitigation Measure SW-1 is adequate and contains sufficient detail and performance criteria (see Section 4.19.9, *Mitigation Measures*).

I9-60 The commenter states that Mitigation Measure SW-2 (containment basin/sump design) needs more detail (e.g., how much freeboard is sufficient). In response to this comment, the following revisions have been made to the Draft EIS/EIR, Section 4.19, *Water Resources*, page 4.19-22, third paragraph under Section 4.19.9:

To ensure that sediment and other pollutants contained in the proposed well construction period containment basins/sumps would not be released into downstream waters, the Applicant shall ensure that all containment basins/sumps are constructed so as to be able to contain anticipated drill cuttings, drilling mud, other drilling liquids, and on-site flows anticipated from a 100-year event with at least one foot of ~~sufficient~~ freeboard to prevent overtopping.

I9-61 The commenter states that the Draft EIS/EIR improperly defers the preparation of a Stormwater Pollution Prevention Plan (SWPPP). The Proposed Action and Alternatives would be subject to the requirements and provisions of the General Construction Permit (Order No. 2009-0009-DWQ NPDES No. CAS000002); one of the requirements is for the preparation of a SWPPP, which must also be made available onsite during construction activities. As described in the Draft EIS/EIR (Section 3.19.2.2), new Construction General Permits require a risk-based permitting approach, dependent upon the likely level of risk imparted by a project. As such, the Applicant would prepare a SWPPP prior to commencing construction activities, as required by law, in accordance with the requirements of Construction General Permit. There is no agency mandate, or other law, that would require the preparation of a SWPPP prior to project review under NEPA or CEQA.

I9-62 The commenter states that the proposed mitigation measures to reduce impacts due to the spread of invasive plant species are inadequate, and states that measures related to invasive plant species exclusively apply only to the Project's construction phase. The mitigation measures presented in the Draft EIS/EIR (pages 4.3-19 to 4.3-21) are adequate and would reduce potential impacts from the spread of invasive plant species to a less-than-significant level. In addition, they apply to all phases of the Project including construction, operation, and decommissioning for the life of the permit (see Response I3-13). The commenter also states that the Draft EIS/EIR must assess the impacts from chemical control methods of noxious weed control. Chemical control (herbicides) of invasive plant species is not proposed as part of any mitigation measure related to control of invasive plant species (see page 4.3-20). Only mechanical or manual removal methods are proposed.

I9-63 The commenter states that Draft EIS/EIR fails to mitigate the Project's potentially significant impacts to special-status species, specifically mentioning impacts to American (Sierra) marten. The mitigation measures presented in the Draft EIS/EIR (pages 4.4-29 to 4.4-32) are adequate and would reduce potential impacts to special-status species, including Sierra marten (Mitigation Measure WIL-3), to a less-than-significant level.

I9-64 The comment states the Project will impact nesting birds, in that: 1) there is an inconsistency in the text related to the stated nesting bird survey area (250 feet) and the size of no-work buffer zones (500 feet), and 2) birds may initiate nesting on the site after breeding bird surveys are complete and prior to Project construction.

Mitigation Measure WIL-1 in the Draft EIS/EIR (page 4.4-29) states that the survey area shall be 1/2 mile for northern goshawk and 250 feet for other nesting birds. The size of

goshawk nest buffer area (0.25-mile) is correctly presented in the analysis; however, the survey area for other nesting birds should be 500 feet. In response to the comment, the third paragraph of Draft EIS/EIR Mitigation Measure WIL-1 on page 4.4-29 is revised as follows:

> **Conduct Pre-construction Nesting Bird Surveys.** If construction, grading or other Project-related activities are scheduled during the nesting season (February 1 to August 31), pre-construction surveys shall be conducted prior to the initiation of construction by a qualified wildlife biologist to identify active hawk nests within 1/2-mile of proposed construction activities and nests of other species within 500 ~~250~~ feet of proposed construction activities.

Additionally, the first paragraph of Mitigation Measure WIL-1 on page 4.4-30 is revised as follows:

> … Project-related construction activities near the nest site. The size of the no-work buffer zone shall be determined in consultation with the CDFW, USFS, and USFWS although a 500-foot buffer would be used initially prior to agency consultation ~~when possible~~. For northern goshawk nests, the buffer should be 1/4 mile...

The Draft EIS/EIR states the standard CDFW requirement that nesting bird surveys will be performed no less than 14 days and no more than 30 days prior to the beginning of each phase of construction. The CDFW generally considers nesting bird surveys valid for a period of up to 30 days, and the minimum 14-day survey window allows for adequate time for contractors to respond to potentially identified nests prior to equipment mobilization. The stated survey periods are consistent with CDFW's interpretation of CDFG Code and the federal Migratory Bird Treaty Act.

I9-65 The comment states that stringent mitigation measures are needed at well pad sump/containment basins, which will be made to contain drilling mud and rock cuttings from the drilling operations to prevent access by wildlife.

As stated in PDM REC-3 of the Draft EIS/EIR (page 2-49 and elsewhere), a temporary fence will be constructed around each containment basin when the associated drill site is not continuously staffed by personnel and until the basin is backfilled. The basins present a potential attractive nuisance and entrapment and drowning hazard to wildlife. General wildlife species will be protected from the basin hazards because: 1) any fluids that accumulate within unmanned pits will only be several inches deep, which will prevent drowning; 2) the basins will have earthen escape ramps to allow wildlife escape; 3) the basins will be fenced to exclude people and wildlife, and; 4) the stated mitigation approach requires alternative deterrent methods such as netting if monitoring finds that basins are hazardous to wildlife.

Upon review of the comment that basins could contain hazardous fluids that could pose ingestion hazards to birds and wildlife, and review of the USFWS publication *Reserve Pit Management: Risks to Migratory Birds* (cited in Comment I9-99), Mitigation Measure WIL-2 on page 4.4-29 is revised as follows:

> **Mitigation Measure WIL-2:** Water which may accumulate in geothermal well site basins from precipitation shall be removed to a standing depth of 2 inches from the respective basins on a daily basis or as soon as operationally feasible; and liquids deposited into the basins shall either be removed daily to a standing depth of 2 inches, or the basins shall be made wildlife escapable by creating earthen ramps at slopes of 1:3 or less at intervals of 100 feet apart or less around the perimeter of the standing depth of the liquid stored in the basin. The basins shall be monitored during well drilling to determine if these measures are effective. If monitoring determines that these measures are ineffective in preventing wildlife from drowning in the basins, an alternative deterrent or escape structure such as netting will be implemented. Alternatives for providing equally effective measures which would allow wildlife to escape unharmed from the well site basins may be authorized subject to USFS, USFS, and CDFW approval. <u>If indications of a hazardous materials release such as oils or surface films are observed in basins, netting or screening shall be used when basins are unstaffed to prevent access by birds and other wildlife.</u>

I9-66 The commenter states that the Draft EIS/EIR mitigation measures fail to reduce the Project's impacts to Owens tui chub and the Hot Creek Fish Hatchery to a level of insignificance. As analyzed in the Draft EIS/EIR, the Proposed Action and Alternatives would avoid any direct impacts to Owens tui chub habitat. The Proposed Action and Alternatives are not expected to result in adverse impacts to Owens tui chub or its habitat. See Response A9-2.

I9-67 The commenter states that the Draft EIS/EIR fails to present an adequate analysis of the Project's cumulative impacts for biological resources in light of the existing geothermal projects. The commenter also states that Draft EIS/EIR fails to account for the reasonably foreseeable future development at the Casa Diablo geothermal complex.

The approach to the analysis of cumulative projects is discussed in Draft EIS/EIR Section 4.1.5, including the geographic and temporal extent of cumulative effects issues. The Draft EIS/EIR also explicitly described its assumptions regarding the Casa Diablo geothermal complex and other reasonably foreseeable future actions. In accordance with BLM NEPA guidance (BLM NEPA Handbook, Section 6.8.3.4), agencies are not required to speculate about future actions. Reasonably foreseeable future actions are those for which there are existing decisions, funding, formal proposals, or which are highly probable, based on known opportunities or trends.

The Draft EIS/EIR sufficiently considers cumulative impacts on biological resources as presented in Sections 4.3.8 and 4.4.8 which include a discussion of cumulative impacts from reasonably foreseeable projects.

I9-68 The comment states that the Project may have cumulatively significant impacts on mule deer because the Project is located within a migration zone and because pipelines and Project features may obstruct deer movement.

Section 4.4-8 of the Draft EIS/EIR (page 4.4-26) discusses the potential cumulative impacts to wildlife resources from the CD-IV Project. As the discussion indicates, deer are expected to continue using movement corridors following the cumulative development scenario. The slightly altered state of movement corridors will change the small-scale movement patterns of migratory wildlife such as mule deer. But the identified direct and indirect effects will be mitigated through the application of identified measures. A discussion of the ecosystem's capacity to support mule deer is beyond the scope of the Draft EIS/EIR analysis; however, the scale of the Project and regional proximity to other cumulative projects identified in the discussion suggests that the presence of substantial foraging habitat in the Project area will not make the area nutrient poor related to deer nutritional needs.

I9-69 The commenter states that Draft EIS/EIR is absent any discussion or analysis of the Project's cumulative impacts on Owens tui chub and the Hot Creek Hatchery. See Response A9-4.

I9-70 The commenter states that a Water Supply Assessment (WSA) would be required for the Proposed Action and Alternatives, per California Water Code section 10912. The Proposed Action and Alternatives would not qualify as a project under Water Code section 10912, e.g., it would not qualify as a 40-acre industrial, manufacturing, or processing plant, as the commenter asserts.

I9-71 The commenter states that the Draft EIS/EIR's conclusion regarding the consistency of the CD-IV Project with the Mono County General Plan is unsupported. Specific examples of inconsistency with the General Plan are listed in Comment I9-72. No response required.

I9-72 As discussed on page 4.10-3 of the Draft EIS/EIR, the CD-IV Project would be located primarily on land designated by the Mono County General Plan as *Resource Management-Inyo National Forest Land & Resource Management Plan (RM-INF)*. This designation recognizes the planning authority of the USFS over the publically owned land. Therefore, General Plan policies are not applicable to those portions of the site designated as *RM-INF*. Regarding that portion of the CD-IV Project located on private land (some segments of the proposed pipeline), implementation of Mitigation Measures and PDMs listed in Section 4.3, *Biological Resources-Vegetation*; Section 4.4, *Biological Resources-Wildlife*; Section 4.7, *Geothermal and Groundwater Resources*; Section 4.8, *Geologic, Soil and Mineral Resources*; and Section 4.19, *Water Resources* would ensure consistency of the Project with the General Plan.

Specifically, Mitigation Measures WIL-4 through WIL-6 listed on pages 4.4-30 through 4.4-32 of the Draft EIS/EIR require the construction of a new deer crossing; undergrounding of certain pipeline segments for migrating deer; and preparation and submittal of a Migratory Deer Monitoring Plan to the BLM and USFS. Regarding hydrologic and biologic baseline information, this Draft EIS/EIR summarizes and references the applicable data. Existing hydrologic monitoring programs under the oversight of the Long Valley Hydrologic Advisory Committee (LVHAC) would be evaluated by the USGS and all LVHAC members and expanded, as needed, to ensure monitoring adequately addresses the Proposed Action, in accordance with the Mono County General Plan, and in accordance with PDM GEO-4 (page 4.8-2). Continued compliance with the LVHAC monitoring, including monitoring determined necessary by the LVHAC for assessment of the CD-IV Project, would be required by the USFS and BLM as Conditions of Approval of the Project. Impacts to trees and other vegetation would be reduced or avoided by PDM BIO-3 listed on page 4.3-2 (post-construction revegetation); PDM HYD-4 (watering of exposed soils) and PDM HYD-6 on page 4.19-1 (minimization of soil disturbance); and implementation of Mitigation Measures VEG-1 and VEG-2 on pages 4.3-18 through 4.3-21.

I9-73 The commenter asserts that the CD-IV Project is inconsistent with the Inyo Forest LRMP because it does not adequately manage riparian areas for fish, the productivity of meadows for the sage grouse, maintain migration corridors for mule deer, maintain the productivity and resources of Hot Creek Fish Hatchery. The Draft EIS/EIR adequately analyzed these LRMP conformance issues. See Response I9-43 for a discussion on the sage grouse. See Response I3-2 through I3-4 for a discussion on mule deer. See Responses A9-2 and A9-4 for a discussion on the Owens tui chub and the Hot Creek Fish Hatchery.

I9-74 In response to this comment, see Responses I9-14, I9-17, I9-24, I9-39, and I14-5

I9-75 See Common Response 1, Decommissioning in Section 6.4.3.

I9-76 See Common Response 1, Decommissioning in Section 6.4.3.

I9-77 The commenter states that the Draft EIS/EIR has no basis for its conclusion that Alternatives 2 and 3 would have similar impacts on biological resources as Alternative 1 because no site-specific studies have been conducted for Alternatives 2 and 3. Site-specific biological studies have been conducted for Alternatives 2 and 3. See Responses I3-10, I3-19, and I9-17.

I9-78 The commenter states that the description of the Jeffrey Pine Vegetation Community is too vague to understand existing conditions and habitat suitability for sensitive species. See Response I9-16.

I9-79 The commenter states that the Draft EIS/EIR fails to provide a sufficient description of sensitive botanical resources. See Response I3-10.

I9-80 The commenter states that the Draft EIS/EIR fails to provide a sufficient description of special-status wildlife, and states that protocol-level surveys for all potentially occurring special-status wildlife species are required. See Response I9-17.

I9-81 The commenter states that the Draft EIS/EIR fails to provide sufficient baseline information on northern goshawk, and states that protocol-level surveys for northern goshawk were not conducted. See Response I9-18.

I9-82 The commenter states that the Draft EIS/EIR fails to provide sufficient baseline information on greater sage-grouse. See Response I9-20.

I9-83 The commenter states that the Draft EIS/EIR fails to provide sufficient baseline information on American (Sierra) marten. See Response I9-19.

I9-84 The commenter states that the applicant did not implement protocol-level surveys for Sierra Nevada red fox, Pacific fisher, and American marten. Protocol-level surveys for each potentially occurring special-status species are not required prior to the CEQA and/or NEPA review process.

I9-85 The commenter states that the Draft EIS/EIR fails to provide sufficient baseline information on pallid bat. See Response I9-22.

I9-86 The commenter states that the Draft EIS/EIR misrepresents the information presented in Paulus' wetland assessment, and misrepresents the extent of jurisdictional waters in the Project area. See Response I3-19.

I9-87 The commenter states that the mapped 1.89 acres of wetlands cited in the Draft EIS/EIR does not necessarily reflect the total extent of jurisdictional wetlands in the Project area. See Response I3-19.

I9-88 The commenter states that the Draft EIS/EIR incorrectly reports the RCA corridors in the Upper Basalt and Basalt Canyon areas. See Response I9-25.

I9-89 The commenter states that the actual extent of waters of the U.S. cannot be determined until Paulus' wetland delineation has been verified by the USACE. Comment noted.

I9-90 The commenter states that the Draft EIS/EIR fails to map or otherwise disclose the extent of other waters of the U.S., waters of the State, and aquatic habitats subject to regulation under Section 1602 of Fish and Game Code. See Response I3-19.

I9-91 The commenter states that the Draft EIS/EIR fails to provide sufficient baseline information on Owens tui chub. See Response I9-23.

I9-92 The commenter states the Draft EIS/EIR fails to disclose or address the Project's potentially significant impacts on tree kills. See Response I9-44.

I9-93 The commenter states that the Draft EIS/EIR fails to provide sufficient baseline information on Owens tui chub. See Response I9-23.

I9-94 The commenter states that the rationale for not considering chemical control as a means of containing and controlling noxious weeds is confusing. See Response I9-62.

I9-95 The commenter states that herbicides use must be identified and analyzed in the Draft EIS/EIR. Herbicide use is not proposed as a means of invasive plant control in the Draft EIS/EIR. See Response I9-62.

I9-96 The commenter states that herbicides may be the only feasible means of controlling some noxious weed species. The containment and control methods proposed in the Draft EIS/EIR (page 4.3-20, Mitigation Measure VEG 2.2) are sufficiently effective to control invasive plant species and herbicide use is not proposed. See Response I9-62.

I9-97 The commenter states that the proposed mitigation measures to reduce impacts due to the spread of invasive plant species are inadequate, and states that measures related to invasive plant species exclusively apply only to the Project's construction phase. See Responses I9-62 and I3-13.

I9-98 The commenter states that potential impacts to special-status plants cannot be evaluated until focused botanical surveys have been completed for the entire Project area. Focused botanical surveys have been completed for the entire Project area, including proposed access roads and buffer areas. The Draft EIS/EIR was incorrect to state otherwise and corrections have been proposed to clarify this. See Responses I3-10 and I9-17.

I9-99 The comment states that the potential wildlife hazards of sump pits must be disclosed and specific chemicals that may enter the pits identified so that related wildlife impacts can be assessed and mitigation strategies can be devised.

Response to Comment I9-51 provides additional information regarding the types of drilling additives commonly used for geothermal drilling. As discussed in Response I9-65, Mitigation Measure WIL-2 has been revised to respond to the potential presence of hazardous materials in pits.

I9-100 The commenter states that the Draft EIS/EIR fails to disclose, analyze and mitigate impacts to northern goshawk. See Response I9-42.

I9-101 The commenter states that the Draft EIS/EIR fails to disclose, analyze and mitigate impacts to greater sage-grouse. See Response I9-43.

I9-102 The commenter states that the Draft EIS/EIR fails to disclose, analyze and mitigate impacts to greater sage-grouse. See Response I9-43.

I9-103 The commenter states that the Draft EIS/EIR fails to disclose, analyze and mitigate impacts to greater sage-grouse. See Response I9-43.

I9-104 The commenter states that the Draft EIS/EIR fails to disclose, analyze and mitigate impacts to greater sage-grouse. See Response I9-43.

I9-105 The commenter states that the Draft EIS/EIR fails to disclose, analyze and mitigate impacts to greater sage-grouse. See Response I9-43.

I9-106 The commenter states that the Draft EIS/EIR fails to disclose, analyze and mitigate impacts to forest carnviores, including Sierra Nevada red fox, Pacific fisher, and American (Sierra marten). See Responses I9-19 and I9-21. The comment also states that the Draft EIS/EIR does not provide mitigation to offset temporary and/or permanent impacts to northern goshawk, greater sage-grouse, pallid bat, Townsend's big-eared bat, and Sierra marten. Mitigation is provided to minimize impacts to these species (see Draft EIS/EIR Mitigation Measure WIL-1 through WIL-3, and WIL-7; Final EIS/EIR Mitigation Measure WIL-9).

I9-107 The commenter states that the analysis and conclusions regarding pallid bat in the Draft EIS/EIR are unfounded. See Response I9-22.

I9-108 The commenter states that the Draft EIS/EIR does not provide an accurate assessment of Project impacts to wetlands and jurisdictional waters of the U.S. See Response I3-19.

I9-109 The commenter states that the Draft EIS/EIR does not adequately assess potentially significant impacts to Owens tui chub. See Responses A9-2 and I9-23.

I9-110 The commenter states the Draft EIS/EIR fails to disclose or address the Project's potentially significant impacts on tree kills. See Response I9-44.

I9-111 The commenter states that the Draft EIS/EIR fails to disclose, analyze, or provide mitigation for potentially significant noise impacts to wildlife species. See Responses I3-3, I3-4, and I9-40.

I9-112 Refer to Response I9-41.

I9-113 The comment suggests that the Project will attract unnaturally high numbers of crows and ravens to the site and cause an unmitigated impact on sage-grouse, deer, and other prey species.

As discussed in Response I3-3, the substation and power plant would be located within fenced, locked facilities and solid waste materials (trash) would be inaccessible to predatory wildlife. Therefore, accumulated food trash is not expected to attract new predators to the Project area. To ensure that new trash sources would not be introduced to the Project area during construction and decommissioning, Mitigation Measure WIL-7 on page 4.4-33 is revised to add the following provision:

c) <u>During construction and decommissioning, solid waste materials (trash) shall be stored in containers that are inaccessible to wildlife. Trash shall be</u>

routinely collected and deposited at an authorized landfill to avoid attracting predators to the Project area.

I9-114 The commenter states that sensitive plant and animal resources have the potential to colonize the Project site during the 30 years prior to decommissioning, and due to this the Applicant should be required to conduct focused surveys for sensitive biological resources prior to decommissioning activities. Decommissioning is anticipated to only directly affect areas that were previously disturbed during installation of the facilities. Thus, impacts to sensitive plant resources are not anticipated for decommissioning activities. Potential impacts to wildlife from decommissioning are discussed in adequate detail in the Draft EIS/EIR (page 4.4-8). Further information on decommissioning can be found in Common Response 1, Decommissioning, in Section 6.4.3.

I9-115 The commenter states that Mitigation Measure VEG-2 (requiring a Weed Management Plan) improperly defers the formulation of adequate mitigation measures. Mitigation measure VEG-2 is adequate and contains sufficient detail and performance criteria (see page 4.3-19 of the Draft EIS/EIR).

I9-116 The commenter states that mitigation measure VEG-1 is inadequate. Mitigation measure VEG-1 is adequate and contains sufficient detail and performance criteria (see page 4.3-19 of the Draft EIS/EIR).

I9-117 The commenter states that mitigation measure VEG-2 has a number of insufficiencies that render it inadequate in preventing the introduction and spread of invasive plant species. Mitigation measure VEG-2 is adequate and contains sufficient detail and performance criteria (see page 4.3-19 of the Draft EIS/EIR). See Responses I3-13 and I3-14.

I9-118 As discussed in Response I9-65, Mitigation Measure WIL-2 has been revised to respond to the potential presence of hazardous materials in pits.

I9-119 As discussed in Response I14-40, Draft EIS/EIR Mitigation Measure WIL-6 has been revised to provide additional detail to the Migratory Deer Monitoring Plan. The revised measure includes the use of remote camera stations to examine deer habitat use. The use of radio-telemetry collars is considered unwarranted.

I9-120 The PDMs and Mitigation Measures provided in the Draft EIS/EIR for the protection of wildlife are adequate. Wildlife habitat losses will occur in Jeffrey pine forest and sagebrush scrub habitat types. Both of these habitat types are abundant in the region and the loss of these habitat types due to Project implementation will not alter the existing bioregional trend for Jeffrey pine or sagebrush scrub habitat in the Project area (see Section 3.3, *Biological Resources-Vegetation*). Compensatory mitigation for losses to these habitat types is not required by any of the regulatory agencies. Impacts to wildlife movement patterns will be reduced to a less-than-significant level through implementation of Mitigation Measure WIL-4 through WIL-6. There is not a need for additional compensatory mitigation.

I9-121 The BLM and the USFWS have identified fragmentation as a primary threat to the greater sage-grouse and their habitat. As the comment indicates, BLM policy addresses the authorization of ROWs in priority sage-grouse habitat using the criteria identified by the commenter (i.e., greater than 1-mile in length and more than two acres). The BLM typically works with applicants on a number of issues, including how best to avoid or minimize loss or fragmentation of sage-grouse habitat. In the case of the CD-IV Project, the location of proposed pipeline facilities adjacent to existing facilities and clustering of development minimizes the potential for fragmentation to greater sage-grouse habitat. The majority of the Project area does not provide habitat for sage-grouse and impacts to this species have been minimized though project design. In their review of the Project Draft EIS/EIR, CDFW did not deem the analysis of sage-grouse impacts or mitigation incomplete or request additional coordination regarding this species. As discussed in Response I14-49, there is no need for additional compensatory mitigation for greater sage-grouse, northern goshawk, Sierra (American) marten, or other special-status wildlife species.

I9-122 As the comment notes, the northern goshawk survey will adhere to standard USFS survey guidance. An inconsistency in the Draft EIS/EIR in describing the survey area for nesting birds is corrected; see Response I9-64. As additionally stated in the response, the stated survey periods are consistent with CDFW's interpretation of CDFG Code and the federal Migratory Bird Treaty Act. Because the Project would not impact breeding birds, the 3-day courtesy notification period to inform resource agencies that breeding bird surveys are complete is appropriate.

I9-123 The commenter states that PDM GEO-5 is not adequate to ensure impacts to Owens tui chub and its critical habitat would be less than significant. PDM GEO-5 is adequate and contains sufficient detail. As analyzed in the Draft EIS/EIR, the Proposed Action and Alternatives would avoid any direct impacts to Owens tui chub habitat. The Proposed Action and Alternatives are not expected to result in adverse impacts to Owens tui chub or its habitat. See Response A9-2.

I9-124 The commenter recommends mitigation measures to protect Owens tui chub should be expanded to include a management plan and reintroduction plan. The PDMs and mitigation measures provided in the Draft EIS/EIR for the protection of Owens tui chub are adequate. Comment noted.

I9-125 The commenter states the Draft EIS/EIR fails to disclose or address the Project's potentially significant impacts on tree kills. See Response I9-44.

I9-126 The comment is an introductory statement and it is understood that further elaboration is forthcoming in subsequent comments.

I9-127 Contrary to the commenter's assertion, the Draft EIS/EIR conclusion that Project operation would have a less than significant effect on the Hot Creek Fish Hatchery and hot springs *does* take into account the results of the model predictions of declines in reservoir pressure, discharge and temperature. As discussed in Section 4.7.4.1, reservoir pressure declines are

estimated to be only 20 percent of the historical reservoir pressure changes observed and are not predicted to cause significant impacts on geothermal features. Minimal temperature changes at Hot Creek Fish Hatchery have been observed in the past in response to geothermal development and significant temperature changes are not anticipated following CD-IV operation, particularly as the thermal water contributes only a small amount to the total outflow to Hatchery Springs. Predicted discharge at Hatchery Springs is forecast to be reduced by less than 1 percent. See also Response I14-22. The Draft EIS/EIR provides a thorough and adequate analysis of these potential effects.

I9-128 The comment questions the Draft EIS/EIR estimates of thermal outflow to Hatchery Springs. Refer to Response I9-45 on the issue of semantics regarding the estimated 17 percent forecast pressure decline. With respect to potential temperature declines at Hatchery Springs, the Draft EIS/EIR Section 4.7.4.1 states that the model predicts the produced temperature of the geothermal wells would decline about 18° F (10°C) over the 30-year life of the Project. In comparison, the temperature of produced fluids declined by approximately 21.6°F (12°C) from Casa Diablo startup to 1993, and subsequently increased close to initial conditions when production was partially transferred to Basalt Canyon. During this period, LVHAC monitoring detected very little (less than 2°F (1.1°C) temperature decline at the Hot Creek Fish Hatchery springs. Based upon the historical response to geothermal fluid temperature decline, the future response to a similar temperature (but lesser) decline can be inferred, without the existing baseline temperature of Hatchery Springs and quantification of the estimated temperature reduction.

For further clarification, however, Response I14-22 provides calculations of predicted temperature declines at Hot Creek Fish Hatchery. By this conservative estimate, the maximum temperature decline would be 2.7°F (1.5°C), although the measured decline would likely be even less due to the reasons described in the response.

The current temperature of the water in Fish Hatchery Springs is readily available in the LVHAC Hydrologic Monitoring Reports (also attached as exhibits to Letter I12). Fish Hatchery Springs includes the AB Springs and the CD Springs. As shown, temperatures have ranged between approximately 15.5 to 18°C in the AB Springs and 13.7 and 16.8 °C in the BC Springs. The potential decline is within the range of variation observed in the hot springs since monitoring began. Most tui chub waters have summer temperatures in excess of 20°C. Their optimal range is 15 to 30°C, though these fish have shown the capability to survive from 2°C to 36°C (Moyle, 2002). Moyle (2002) identifies that spawning typically occurs at temperatures between 13 and 17°C, typically when temperatures rise between late April and early July; however, it ranges from February through late August in some springs and warm ponds.

The comment incorrectly cites that the optimal temperature range for Owens tui chub as between 15 to 20°C, as fish can withstand a much broader temperature range, as described by Moyle (2002). The comment correctly identifies that spawning is triggered by warming water temperatures with the optimal range for spawning generally between 13 to 17 °C.

Following Project implementation, Owens tui chub are expected to continue spawning when water temperatures rise during late spring and summer months. Owens tui chub can survive temperatures as low as 2°C without ill effects, thus, temporary fluctuations into the 12 °C range would not cause physiological stress to individual fish or tui chub populations.

I9-129 Refer to Response I14-22.

I9-130 Refer to Response I14-22.

I9-131 This comment correctly states the Draft EIS/EIR conclusion that the CD-IV Project would not have a substantial adverse effect on hydrothermal resources in the Casa Diablo area. The comment is an introductory statement and it is understood that further elaboration is forthcoming in subsequent comments. The commenter is directed to Responses I9-132 through I9-135.

I9-132 This comment reiterates statements presented in Comments I9-45 and I9-46. Refer to the responses to these comments, as well as Comment I14-22. The analysis in the Draft EIS/EIR was appropriately conservative and adequately assess the potential impact on Hot Creek Hatchery and Hot Creek Springs.

I9-133 See Common Response 4, Hydrologic Monitoring in Section 6.4.3.

I9-134 See Common Response 4, Hydrologic Monitoring in Section 6.4.3.

I9-135 See Common Response 4, Hydrologic Monitoring in Section 6.4.3.

I9-136 This comment reiterates statements presented in Comments I9-51and I9-52. Refer to the responses to these comments.

I9-137 This comment reiterates statements presented in Comments I9-50 and I9-53. Refer to the responses to these comments.

I9-138 The commenter states that the Draft EIS/EIR does not analyze the potential water quality impacts of pipeline construction activities. Such impacts are analyzed in the Draft EIS/EIR (see Section 4.19.4.1, *Direct and Indirect Impacts*).

I9-139 The commenter states that mitigation measure SW-2 is vague and the 100-year peak storm event should be calculated and used to size the containment basins/sumps. See Response I9-60.

I9-140 The commenter summarizes mitigation measure SW-1 and states that a few of the well sites are located just outside of the 100-year flood hazard zone. This comment does not pertain to the adequacy or accuracy of the Draft EIS/EIR; the comment is noted.

I9-141 The commenter suggests that the containment basins/sumps be constructed to contain flows from a 100-year flood event (as opposed to a 100-year storm event, as described in the

Draft EIS/EIR). Given the small drainage areas of each proposed containment basin/sump site, the 100-year storm event and 100-year flood event are essentially synonymous. Further, the proposed retention facilities would be located outside of the 100-year flood hazard zone (as show on Figure 3.19-1 of the Draft EIS/EIR).

I9-142 The commenter states that a revised Draft EIS/EIR should be prepared to evaluate potential failure of the stormwater retention facilities and containment basins/sumps. Further, the commenter states that the drainage plan should be prepared prior to construction and included in a revised Draft EIS/EIR. The stormwater drainage features and containment basins/sumps would be designed and sized according to criteria set forth in the Draft EIS/EIR (see Section 4.19.4.1, *Direct and Indirect Impacts,* and Section 4.19.9, *Mitigation Measures*), as well as according to standard best management and/or engineering practices. An assessment of extreme and/or catastrophic events with respect to design is not required under either NEPA or CEQA. The drainage plan, as well as a SWPPP, would be prepared prior to construction of the selected alternative.

I9-143 The comment states that a SWPPP should be prepared. See Response I9-61.

I9-144 The commenter states that the Draft EIS/EIR is inadequate because it only addresses use by deer during the fall migration or by "resident" deer prior to the fall migration, and does not include baseline information or analysis of impacts during spring. See Response I9-15.

I9-145 The commenter states that the Draft EIS/EIR fails to adequately identify and analyze the potential for the Project to yield increased mortality in mule deer resulting from vehicle collisions. Mule deer and vehicle collisions are adequately discussed in the Draft EIS/IER (see pages 4.4-16 and 4.4-17, and Responses I2-5, I3-2, I3-3, I3-4, I3-7, I3-8, and I3-9).

I9-146 The commenter states the Draft EIS/EIR fails to analyze impacts to deer from new noise sources or the installation of new linear barriers. See Response I3-3 regarding impacts associated with new noise sources. Impacts to migrating deer from new linear barriers are discussed in the Draft EIS/EIR (see pages 4.4-14 to 4.4-19).

I9-147 The commenter states that the Draft EIS/EIR fails to consider prior planning documents related to the protection of mule deer habitat and migration corridors. The Draft EIS/EIR is in compliance with all relevant regulations and planning documents related to the protection of mule deer habitat and migration corridors.

I9-148 The commenter states the Draft EIS/EIR does not address the Project's cumulative impacts to mule deer. Section 4.4-8 of the Draft EIS/EIR (page 4.4-26) discusses the potential cumulative impacts to wildlife resources from the CD-IV Project. See Response I9-68.

I9-149 The commenter states the Draft EIS/EIR fails to adequately analyze impacts to mule deer from a decrease in forage availability, impacts from new barriers to migration, and impacts from vehicle collisions. These impacts are discussed in the Draft EIS/EIR (see page 4.4-14 through 4.4-19, and Responses I2-5, I3-2, I3-3, I3-4, I3-7, I3-8, and I3-9).

I9-150 The commenter states that PDM BIO-1 is flawed and that there is an absence of language that would require action in the PDM. Please see Response I14-40. In addition, PDM BIO-1 is designed to be supplemented by additional mitigation measures (Mitigation Measure WIL-4 through WIL-6) that will work in coordination with each other to reduce impacts to migratory deer.

I9-151 The commenter states that it is impossible to determine that there would be any meaningful benefits in implementing Mitigation Measure WIL-4. WIL-4 is designed to enhance mule deer and other wildlife movement through the Project area. The implementation of WIL-4 will provide a crossing point over the proposed pipeline that will run south of the power plant site between the existing substation and the existing MP-1 power plant site.

I9-152 The commenter states that Mitigation Measure WIL-5 is inadequate due to a lack of evidence that deer will use the underground segments as crossing points in their migration and that the measure contains no guarantee that the frequency of underground segments will be meaningful for providing passage for mule deer. The commenter also states that the overhead segments must be installed at heights sufficient to allow mule deer, and not just "wildlife", to pass under them. Mitigation Measure WIL-5 as presented in Draft EIS/EIR is adequate and would, in combination with PDM BIO-1, Mitigation Measure WIL-4, and WIL-6, reduce impacts to migratory mule deer to a less than significant level. Also see Response I9-35.

I9-153 The commenter states that Mitigation Measure WIL-6 fails to incorporate performance measures. See Response I14-40.

I9-154 The commenter requests clarification of what the term "threat" is referring to on page 4.4-17 of the Draft EIS/EIR. In response to this comment, the following revisions have been made to the Draft EIS/EIR, Section 4.4, *Biological Resources – Wildlife*, page 4.4-17, second paragraph):

> Also, implementation of **Mitigation Measure WIL-4** would provide deer a pipeline crossing south of the proposed plant site. This would reduce but not eliminate the threat from collisions with vehicles to migrating deer that this segment of pipeline poses.

The commenter also states that there are no performance measures included for the proposed mitigation. See Response I14-40.

I9-155 The comment is a concluding statement. The commenter is directed to Responses I9-144 through I9-154.

I9-156 The comment is a summary statement that the Draft EIS/EIR may have underestimated construction-related emissions and fails to require adequate mitigation to reduce NO_x emissions. The specific comments to support the statement are addressed in subsequent responses.

I9-157 See Response I9-31.

I9-158 See Response I9-31.

I9-159 See Response I9-31.

I9-160 Subsequent to the release of the Draft EIS/EIR, the Applicant has confirmed that Tier 2 and Tier 3 engines would be used on the drill rig(s) (ORNI 50, LLC, 2013). To formalize this commitment, Mitigation Measure AQ-2 has been added to Section 4.2.9, *Mitigation Measures*, on Draft EIS/EIR page 4.2-20. See Response I9-31 for the text of Mitigation Measure AQ-2.

I9-161 The commenter acknowledges that Mitigation Measure AQ-1 is feasible and routinely required by other agencies, but recommends amending the measure to strengthen its intent. However, the recommended amendment to Mitigation Measure AQ-1 would appear to substantially weaken the intent of the measure. In fact, the commenter's amended measure makes no reference to the amount of emissions reductions that would be required, and only focuses on submittal of an inventory of the off-road construction equipment to be used. To allow for flexibility in implementation of Mitigation Measure AQ-1, the specifications of the plan with respect to documentation of the required construction equipment will be developed by ORNI 50, LLC, and approved by GBUAPCD prior to the commencement of construction activities. The suggested amended mitigation measure has not been incorporated.

I9-162 The commenter indicates that public health risks and odor impacts related to H_2S identified in the Draft EIS/EIR are inadequate and provides information related to health effects of H_2S exposure. The information related to health effects of H_2S exposure is noted. In addition, upon Project approval the GBUAPCD would issue an Authority to Construction permit for well drilling activities that would require well site monitoring of H_2S as well as development of an H_2S abatement plan should levels temporarily exceed 2.5 kg/hr. To formalize this requirement for the purposes of this NEPA/CEQA review, Mitigation Measure AQ-4 had been added to the Draft EIS/EIR (see Response A8-6).

I9-163 The commenter includes a discussion of H_2S odor thresholds and potential health effects at various levels of exposure, and indicates that since the Draft EIS/EIR discloses that the CD-IV Project could result in release of 2.5 kg H_2S per hour during well testing, large quantities of H_2S could accumulate in the vicinity and present an odor nuisance as well as a public health hazard. As described in Response A8-6, Mitigation Measure AQ-4 has been added to the Draft EIS/EIR to require well site monitoring of H_2S as well as development of an H_2S abatement plan should levels temporarily exceed 2.5 kg/hr.

Although it is possible that geothermal fluids and associated H_2S could be accidentally released to the environment as a result of spills at the well sites or power plant, pipeline rupture, or uncontrolled releases from the wells ("well blowouts"), Project Design Measures HYD-11 through HYD-13 commits the Applicant to install isolation valves to

prevent backflow along the geothermal pipelines, install in-line sensing equipment and automatic shutdown controls in the event of sudden pressure drops or electric failures, and requires implementation of a Spill or Discharge Contingency Plan and a Well Blowout Contingency Plan. Implementation of these measures would ensure that any potential spills, leaks, or ruptures would result in limited release of geothermal fluids and associated H_2S.

I9-164 See Responses I9-162 and I9-163.

I9-165 See Responses I9-162 and I9-163.

I9-166 The commenter states that Ormat's fugitive n-pentane emissions estimates identified in the Draft EIS/EIR are not adequately supported. The specific calculations used by Ormat to estimate the fugitive n-pentane emissions that would be associated with the CD-IV Project are not available for public review because Ormat considers much of that information to be confidential and proprietary. However, Ormat has confirmed that the fugitive n-pentane emissions calculations are based on USEPA protocol for estimating gaseous leak emissions. Also, refer to Responses I9-167 and I9-168.

I9-167 The commenter indicates that there would be no verification of the fugitive n-pentane estimates provided in the Draft EIS/EIR. However, the Permit to Operate the plant that would be issued by the GBUAPCD would include a condition to limit fugitive releases of n-pentane to the amount identified in the Draft EIS/EIR (i.e., 410 pounds per day). The Permit to Operate would include monitoring and reporting requirements to ensure that the identified value for fugitive emissions is not exceeded. The exact terms and conditions of the Permit to Operate the plant would not be identified until after Project approval; therefore, it is appropriate for the EIS/EIR to identify binding mitigation that will be consistent with the requirements of the permit to ensure that fugitive releases of n-pentane are limited to 410 pounds per day.

The first paragraph on Draft EIS/EIR page 4.2-13 has been revised as follows:

> The CD-IV Project would include state of the art equipment and best available technology designed to limit fugitive n-pentane emissions; therefore, there is no additional feasible mitigation that can be applied to the CD-IV Project to substantially reduce the long-term fugitive ROG emissions. However, **Mitigation Measures AQ-5 and AQ-6** are recommended to ensure that fugitive releases of n-pentane are limited to 410 pounds per day.

Mitigation Measure AQ-4 has been added to Section 4.2.9, *Mitigation Measures*, on Draft EIS/EIR page 4.2-20 as follows.

> **Mitigation Measure AQ-5:** ORNI 50, LLC shall prepare and implement an Emission Management Plan for review and approval by the GBUAPCD Air Pollution Control Officer, which shall contain the following:

- A description of the method to determine the daily n-pentane volume in the plant.
- An explanation of how to calculate n-pentane loss rates over a given period.
- An action plan for detecting and reporting breakdown events under GBUAPCD Rule 403.B, when n-pentane leaks emit more than 410 pounds per day.
- An action plan for repairing leaks associated with breakdown events. A maintenance plan for routine monitoring and prevention of n-pentane leaks.
- A format for quarterly reports on n-pentane losses and purchases. The Emissions Management Plan shall be updated as necessary in order to ensure compliance with federal, state, and/or district rules and to incorporate management plan improvements if necessary.

I9-168 As described in Response I9-167, Mitigation Measure AQ-5 would require the Applicant to submit quarterly reports associated with n-pentane losses and purchases.

I9-169 The commenter indicates that there are feasible mitigation measures available to reduce fugitive n-pentane emissions beyond the best available technology proposed for the CD-IV Project. The commenter also lists the Applicant's proposed emission reduction concepts and technologies. This comment is noted. Also, refer to Response I9-170.

I9-170 The commenter indicates that the CD-IV Project's motive fluid system should use leakless technology to avoid fugitive emissions of n-pentane. The proposed motive fluid system does include limited leakless technology, including welded connections wherever feasible and practical (ORNI 50, LLC, 2013). For example, pipeline runs, elbows, and transitions would be welded. Leakless technology would not be feasible or practicable for some components of the motive fluid system. For example, valves would be flanged in case they would ever need to be replaced and instrumentation would need to be threaded to allow for calibration and/or replacement.

I9-171 It appears that the commenter is referencing the second bullet of the proposed BACT technologies shown in Comment I9-169; however, that bullet is in reference to proposed vapor recovery devices that are estimated to return at least 99 percent of the motive fluid back to the system. Therefore, the 99 percent is a reference to the efficiency of returning motive fluid back to the system, which is not a direct reference to the efficiency of controlling and recovering n-pentane emissions.

I9-172 The commenter indicates that the Draft EIS/EIR should be revised to require USEPA leak detection and repair methods. The Permit to Operate would include monitoring requirements per USEPA regulatory methods, including Reference Method 21. The exact terms and conditions of the Permit to Operate the plant would not be identified until after Project approval; therefore, it is appropriate for the EIS/EIR to identify binding mitigation

that will be consistent with the requirements of the permit to ensure that leak detection monitoring is conducted per USEPA methods. Mitigation Measure AQ-6 has been added to Section 4.2.9, *Mitigation Measures*, on Draft EIS/EIR page 4.2-20 as follows.

> **Mitigation Measure AQ-6:** ORNI 50, LLC shall obtain a portable Volatile Organic Compound (VOC) leak detector capable of meeting the performance specifications described in USEPA's Source Test Reference Method 21. This instrument shall be properly maintained, calibrated, and made readily available at all times on the property site. The instrument shall be used at least on a monthly basis to assist ORNI 50, LLC personnel in detecting n-butane leaks from all flanges, valves, pump seals, safety relief valves, n-butane accumulator vessels, and turbine gland seals. Whenever a leak is detected that is greater than 10,000 ppmv from any aforementioned equipment, ORNI 50, LLC shall initiate repairs as soon as practical. Once a leak is discovered, ORNI 50, LLC shall tag and log its location, record the leak concentration, record the date, and record the dates of each repair attempt. A report that includes the six-month average daily emission calculations and n-pentane purchases shall be submitted electronically to the GBUAPCD within 30 days from the end of each calendar quarter. A summary record of the leak repairs made shall also be submitted to the GBUAPCD when reporting n-pentane losses.

I9-173 Refer to Response I9-33.

I9-174 The commenter requests that a revised Draft EIS/EIR be prepared to address her comments; however, as discussed in the responses above, the commenter's comments do not identify a compelling reason for the preparation of a revised Draft EIS/EIR. Also see Common Response 2, Recirculation in Section 6.4.3.

Letter I10 – Responses to Comments from Mammoth Lakes Trail Public Access (MLTPA)

I10-1 See Response A4-1.

I10-2 See Response A4-2.

I10-3 The commenter indicates that the Inyo National Forest Shady Rest Motorized Staging Area project be cited in Draft EIS/EIR Section 3.14.2, *Applicable Regulations, Plans, and Policies / Management Goals*. It is noted that this project is not a regulation, plan, or policy. The staging area project is however included and analyzed as a cumulative project. See Section 4.14.8, *Cumulative Impacts*.

I10-4 The commenter recommends that additional portions of the Mammoth Lakes Trail System Master Plan, which are detailed in comments I10-5 through I10-8, be included in Section 3.14.2, *Applicable Regulations, Plans, and Policies / Management Goals*. This comment is noted. The applicable regulations, plans, and policies sections of the Draft EIS/EIR

summarize key elements of plans, including the Mammoth Lakes Trail System Master Plan, that directly relate to the effects of the Proposed Action. However, the overall Mammoth Lakes Trail System Master Plan was reviewed in the context of the Proposed Action.

I10-5 The commenter recommends that the date of completion and adoption of the Mammoth Lakes Trail System Master Plan be included in Section 3.14.2, Applicable *Regulations, Plans, and Policies / Management Goals*. See Response I10-4.

I10-6 The commenter recommends that additional portions of the Mammoth Lakes Trail System Master Plan regarding Shady Rest Park be included in Section 3.14.2, *Applicable Regulations, Plans, and Policies / Management Goals*. See Response I10-4. In addition, Shady Rest Park was described in Section 3.14.1.1 and the effects of the Proposed Action on Shady Rest Park were addressed in Section 4.14, under of the heading "Recreation Facilities and Sites."

I10-7 The commenter recommends that additional portions of the Mammoth Lakes Trail System Master Plan regarding Future Trail System Recommendations be included in Section 3.14.2, *Applicable Regulations, Plans, and Policies / Management Goals*. See Response I10-4. In addition, the Town of Mammoth Lakes Trail System Master Plan is included as a cumulative project. The cumulative impacts of the Trail System Master Plan, the Proposed Action, and other cumulative projects were addressed in Draft EIS/EIR Section 4.14.8, *Cumulative Impacts*.

I10-8 The commenter suggests inclusion of Map 4-7 (Recommended Trail System Master Plan) from the Town's Trail System Master Plan" to the Draft EIS/EIR. The commenter also recommends that Figure 4.14-1 have a companion figure for winter uses. Section 3.14 and Figure 4.14-1 includes a summary of existing recreation uses and facilities; however, as discussed in Response I10-7, implementation of the potential future Mammoth Lakes Trail System Master Plan trail elements was included in the cumulative impact analysis, and considers potential future trails in the Shady Rest Park area. The Draft EIS/EIR includes Figure 3.14-2 to display winter recreation routes.

I10-9 See Response A4-4.

I10-10 See Response to Comment A4-5. Regarding Recreation, PDM's listed on pages 4.14-2 through 4.14-4; Mitigation Measures REC-1 through REC-3; and Mitigation Measures VIS-1 through VIS-3, would avoid or substantially reduce these impacts.

I10-11 The commenter references and summarizes Comment A4-06 and refers to Comment I10-02, which notes the documented history of confusion with regards to maintenance responsibilities on local roads. The commenter indicates that the same confusion exists with regards to the status of "use trails" and "USFS system trails" in the Project area and region. See Responses A4-6, A4-8, and I10-02. Section 4.14.4.1 addresses direct and indirect

impacts on trails (includes both USFS roads and other trails), roads, and bicycle routes that serve recreational resources within the Project vicinity.

I10-12 The commenter indicates that analysis of effects on cross country recreation use is inadequate. See Response A4-7 and A4-9, and the associated changes to text that more clearly identify cross country uses and effects on those uses as a result of the Proposed Action.

I10-13 The commenter references and summarizes comment A4-7. The comment states that a complete analysis will demonstrate that recreation options would be impeded from all directions with implementation of the geothermal pipeline. The commenter also indicates that the impact analysis of recreational activities relative to the Shady Rest Park Trailhead and the entire Project site is inadequate. Refer to Response A4-7.

I10-14 The commenter references and summarizes comment A4-8. The comment recommends that a thorough analysis of recreation patterns describing potential conflicts with the proposed pipelines be conducted. See Response A4-8.

I10-15 The commenter indicates that there may be less expensive alternative to pipeline burial, but adequate analysis of recreation activities and use patterns is required to understand the impacts of the Project. See Response A4-12.

I10-16 The commenter references and summarizes comment A4-9. The commenter states that the timing, scheduling, and phasing of any plowing or potential grooming must be integrated into the local recreation communications infrastructure. See Responses A4-7 and A4-9 for information about the effects of plowing on recreational uses.

I10-17 The commenter references and summarizes comment A4-10. See Response A4-10. The commenter also notes that the impact analysis address effects of the pipeline on cross country travel, which may be unrelated to an established trail or road. See Responses A4-7 and A4-9.

I10-18 The commenter references and summarizes comment A4-11. The commenter states that the analysis should address the effects of the expansion of pipelines at crossings where the pipelines are buried. See Response A4-11.

I10-19 The commenter references and summarizes comment A4-12. The comment also refers to previous comments supporting the need to quantify and provide numeric estimates of the level of recreation use and the variety of recreation activities. See Response A4-12.

I10-20 The commenter references and summarizes comment A4-13. The commenter also notes that the Draft EIS/EIR should properly evaluate the effects of these pipeline crossings by using existing recreation usage data. See Response A4-7 and A4-12.

I10-21 The commenter references and summarizes comment A4-14. See Responses A4-8 and A4-14. In addition, there are no anticipated new or fluctuating recreation uses that would result in additional constraints on recreation uses in the Project vicinity, with the exception of proposed projects discussed in Section 4.14.8, *Cumulative Impacts*.

I10-22 The commenter references and summarizes comment A4-15. See Response A4-15. The commenter also recommends that mitigation measures should consider signage and wayfinding, flagging, and smart phone tolls that can advise recreationists on crossing opportunities and the proximity of obstacles cause by the Project. Mitigation Measures REC-1, REC-2, and REC-3 would require ORNI 50, LLC to post information materials and signage at nearby recreational areas.

I10-23 The commenter references and summarizes comment A4-16. See Response A4-16.

I10-24 The commenter suggests revisions to the recreation mitigation measures. As a result of this comment and comments A4-9, I11-19, and I11-20, Mitigation Measures REC-1 and REC-3 have been revised:

> **Mitigation Measure REC-1:** ORNI 50, LLC shall post informational materials about the CD-IV Project at, but not limited to: nearby recreation sites / campgrounds, access points, the Mammoth Lakes Trail System website, and the Mammoth Welcome Center. This material shall include construction schedules and safety information regarding trucks and other heavy equipment use on local roads and NFSRs, and identify route closures. Signage shall be designed to function during winter and non-winter conditions, and shall be consistent with USFS and Town of Mammoth signage requirements, as appropriate. In addition, construction vehicle speed shall be limited to 15 miles per hour; with temporary signage warning construction vehicles to reduce speeds in areas with blind corners, narrow roads, or hills.
>
> **Mitigation Measure REC-3:** ORNI 50, LLC shall provide information regarding pipeline crossing locations and road closures at, but not limited to: nearby recreation sites / campgrounds, access points, the Mammoth Lakes Trail System website, and the Mammoth Lakes Visitor Center. Signage shall be designed to function during winter and non-winter conditions, and shall be consistent with USFS and Town of Mammoth signage requirements, as appropriate. In addition, operational vehicle speed shall be limited to 15 miles per hour road and signage shall be installed, consistent with USFS and County requirements. ORNI 50, LLC shall also coordinate with the Town of Mammoth and the USFS to ensure that the OSV staging area and access to the staging area is plowed to provide winter access. In addition, banks formed by road plowing shall be shaped such that crossing grade changes are gradual in areas where cross country use is prevalent.

I10-25 The commenter indicates that the Draft EIS/EIR should address agency resources necessary to plan and program multiple recreation activities. The commenter also requests that the Draft EIS/EIR analyze the needs for public agencies and the community to program, outreach and provide reliable information associated with the CD-IV Project. The

Draft EIS/EIR Section 4.14 analyzes the effect of the Proposed Action and cumulative actions on recreation resources and uses in the Project vicinity, including coordination with land management agencies as applicable. In addition, implementation of Mitigation Measures REC-1 and REC-3 will require coordination with applicable land management agencies. With respect to the portion of the comment requesting that the EIS/EIR analyze management requirements for public agencies managing other recreation activities, the applicant is only required to comply with PDMs and Mitigation Measures as they apply to the effects of the Proposed Action and its cumulative impacts.

I10-26 Refer to Responses A4-18 through A4-21.

I10-27 Please see Response A4-22.

I10-28 Please see Response A4-23.

I10-29 Please see Response A4-24.

I10-30 The comment supports comment A4-25 and requests that the impact analysis take into account recreation usage data to describe visual impacts on specific recreation activities. The commenter provides a list of recreation activities that take place within the Project area including birding, cross country skiing, hiking, mountain biking, running, snowmobiling, snowshoeing, vista viewing, and other activities.

As described in Response A4-12, there are no available data quantifying recreation use in the Project area; however, the recreation analysis acknowledges the area to be a popular recreation area. To further address this comment, Section 4.18.4.1of the Draft EIS/EIR (page 4.18-7, fourth paragraph) is revised as follows:

> **Well Site Facilities**
>
> Well site facilities (including the well head, pump motor, pump control building, well head fence and well site pipeline) would be hidden or fully obscured from view by vegetation and terrain from designated scenic highways. However, as described below, several well facilities would be visible from roads such as Sawmill Road (03S25) and Sawmill Cutoff Road (NFSR 03S08). As described in Section 4.14, *Recreation*, these roads are highly used for a wide range of recreation activities. During winter seasons, snowmobilers and cross-country skiers would have views of these well facilities. Likewise, during summer months, hikers, mountain bikers, and other recreationists would have views of these well facilities. These facilities would appear similar to existing well facilities constructed on drill site 66-25, shown in Figure 4.18-3. Impacts on views of well facility site 38-25 from Shady Rest Park are described below under the subheading "Designated Scenic Highways and KOPs."

Section 4.18.4.1 of the EIS/EIR (page 4.18-11, second paragraph) is revised as follows:

Sawmill Cutoff Road and Shady Rest Park. The new pipelines would be eight to 24-inch diameter welded-steel pipe and the overall outside diameter would range from 12 to 28 inches with insulation included. The pipelines would be constructed near ground level on pipeline supports and would appear similar to the existing Basalt Canyon pipeline (as shown in Figure 3.18-4, Photos 5 and 6). Recreationists along Sawmill Cutoff Road (NFSR 03S08), including hikers, joggers, mountain bikers, snowmobilers, and cross country skiers, may notice the pipelines, and the taller crossovers. ~~"expansion loops" or square bends along the production pipeline route, where the pipeline lengthens and shortens.~~

Section 4.18.4.1 of the EIS/EIR (page 4.18-15, second paragraph) is revised as follows:

Views from Shady Rest Park - KOP 3. The well facility proposed at the eastern end of Shady Rest Park (38-25) would appear similar to existing well facility constructed on drill site 66-25, as shown in Figure 4.18-3. Construction of this new facility would substantially alter the visual character of this site as ORNI 50, LLC would clear approximately 2.5 acres of trees and other vegetation for the well site facilities. Fencing would be installed around the well site. Implementation of PDM VIS-4 would require the well site facility is painted a neutral color to blend in with the existing environment. Nonetheless, the 10-foot high motor control building would still be visible from the Shady Rest Park parking lot and Sawmill Road (03S25), which is ~~occasionally~~ commonly used by hikers, snowmobilers, cross-country skiers, and other recreationists, who typically expect quality views.

I10-31 MLTPA's concurrence with the Town of Mammoth Lakes' comment is noted. See Response A4-29.

I10-32 MLTPA's concurrence with the Town of Mammoth Lakes' comment is noted. See Response A4-30.

I10-33 The commenter indicates that should the impact analysis identify degradation of recreation experiences, it would be possible to mitigate these effects through projects under consideration by the Town. See Response I10-25.

Letter I11 – Responses to Comments from Sierra Club

I11-1 The comment is an introductory statement and it is understood that further elaboration is forthcoming in subsequent comments. The commenter is directed to Responses I11-2 through I11-31.

I11-2 Comment noted. The Project's potential effects on sensitive air quality and noise receptors, recreation, socioeconomics and environmental justice, traffic and transportation, utilities and public services, visual quality, and other resource areas within the Town of Mammoth Lakes are analyzed throughout Draft EIS/EIR Chapter 4.

I11-3 The comment states that the Draft EIS/EIR must include alternatives and mitigations that will mitigate or eliminate the potential for adverse impacts on Owens tui chub and/or its critical habitat. Potential impacts to Owens tui chub from operation of the Proposed Action and Alternatives is discussed and considered in the Draft EIS/EIR (pages 4.4-8, 4.4-13, 4.4-14, and 4.4-19). As analyzed in the Draft EIS/EIR, the Proposed Action and Alternatives would avoid any direct impacts to Owens tui chub habitat. The Draft EIS/EIR explains that there is no Owens tui chub habitat in the Project area and potential impacts to Owens tui chub habitat is limited to possible changes that could occur to springs which support the species critical habitat near the Hot Creek Hatchery. See Response A9-2. The range of alternatives presented in the Draft EIS/EIR is adequate under CEQA and NEPA.

I11-4 The comment states that the Draft EIS/EIR fails to analyze the impacts related to the reduction in thermal outflow to Hatchery Springs. As the commenter notes, the CD-IV Project is forecast to reduce the thermal outflow to Hatchery Springs by about 17 percent. However, as explained in the Draft EIS/EIR (pages 4.4-13 and 4.7-7), the thermal water fraction is a very is a very small part (less than 5 percent) of the total flow so the forecast impact to the combined cold and thermal discharge at the springs is forecast to be reduced by 0.85 percent and is not likely to be measureable relative to climatic effects. In addition, conductive buffering of the temperature would minimize potential temperature changes making such changes difficult to detect. As such, the Proposed Action and Alternatives are not expected to result in adverse impacts to Owens tui chub or its habitat. In addition, PDM GEO-5 is commits the applicant to operations and monitoring programs designed to prevent, or mitigate, potential hydrothermal impacts to the Owens tui chub critical habitat, Hot Creek Hatchery and Hot Creek Gorge springs from geothermal operations conducted on federal leases in the Mono-Long Valley KGRA. See Response A9-2 and Common Response 4, Hydrologic Monitoring, in Section 6.4.3 and Response I14-22.

I11-5 The comment refers to "new, unmentioned 2012 LVHAC data" that shows a decrease of output in thermal springs in the area. The BLM and the preparers of the Draft EIS/EIR assume that the commenter is referring to the LVHAC Monitoring Data report which contains unpublished provisional USGS data through July 2012. This report was included as Letter I12, Exhibit 2. The USGS provisional data shows similar trends to LVHAC monitoring data used in preparation of the Draft EIS/EIR. The trends do show a small decline in the thermal water discharge since about 2005. It should be noted that this is not a measured value, but a calculated value based on water chemistry (see Response I14-22). Further, although thermal water discharge has declined slightly, a corresponding effect on water temperature is not observed.

I11-6 The comment states that the Draft EIS/EIR defines the habitat area for analysis too narrowly for Owens tui chub, not giving sufficient attention to the Hot Creek Fish Hatchery Springs area. Indirect impacts to Owens tui chub and its habitat are discussed in the Draft EIS/EIR (pages 4.4-13 and 4.4-14), including potential impacts to habitat at the Hot Creek State Fish Hatchery.

I11-7 The commenter states that the development of monitoring plans for Owens tu chub and its habitat must be specified and detailed as part of the Draft EIS/EIR prior to approval of the Project. PDM GEO-5 commits the applicant to operations and monitoring programs designed to prevent, or mitigate, potential hydrothermal impacts to the Owens tui chub critical habitat, Hot Creek Hatchery and Hot Creek Gorge springs from geothermal operations conducted on federal leases in the Mono-Long Valley KGRA. Also see Common Response 4, Hydrologic Monitoring in Section 6.4.3.

I11-8 This comment states that ROLG supports the concerns of MCWD. Refer to the responses to MCWD Letter A10 and Common Response 4, Hydrologic Monitoring in Section 6.4.3.

I11-9 See Response A4-4.

I11-10 The commenter indicates that air pollution negatively impacts recreation activities. See Response I7-2.

I11-11 The commenter indicates the Draft EIS/EIR does not address recreation impacts sufficiently and references the comments of the MLTPA, Mammoth Nordic, and Town of Mammoth Lakes. This comment is noted. See the responses to comments submitted by those parties.

I11-12 The commenter requests quantification of recreation uses and more detail regarding non-winter use. See Responses A4-7, A4-10, and A4-12.

I11-13 The commenter indicates that only NFSR roads are considered in the impact analysis. See Responses A4-7 and A4-8.

I11-14 The commenter indicates that off-trail use should be considered. See Responses A4-7, A4-9, and I2-2.

I11-15 The commenter suggests that the USFS separate motorized and non-motorized users to avoid conflicts. The USFS does not currently have a policy or goal of separated recreation uses in the Project vicinity.

I11-16 The comment recommends that the impact analysis evaluate visual effects of the geothermal pipeline more fully to consider trail usage. The commenter also notes that it is difficult to evaluate the effectiveness of mitigation measures proposed in the EIS/EIR. The comment requests that field trips be provided to users to provide information on potential visual impacts. Refer to Response I10-30 regarding visual effects on recreational uses in the Project area. With respect to the request that field trips be provided, this portion of the comment does not address the accuracy or adequacy of the EIS/EIR; therefore, no response is provided.

I11-17 The commenter requests further information on pipelines and that additional crossings be considered. See Responses I2-4 and I2-6.

I11-18 The commenter indicates that the Draft EIS/EIR does not demonstrate that the design of underground pipelines would prevent snowmelt. See Response A4-16.

I11-19 The commenter suggests additional requirements for signage requirements. See the text revisions described under Response I10-24.

I11-20 The commenter indicates the analysis of the Project with respect to the Trail System Master Plan is insufficient and indicates that signage requirements should be consistent with that plan. See Response I10-7 and text revisions described under Response I10-24.

I11-21 The commenter indicates that the analysis of the Inyo National Forest Shady Rest Motorized Staging Area project should be referenced and taken into account. See Response I10-3.

I11-22 For discussion related to the effects of CD-IV Project-related pump noise on Shady Rest Park, refer to Responses A4-18 through A4-21.

I11-23 The commenter recommends mitigation to limit vehicle speed and access on Project access roads to reduce noise. As noted on the second full paragraph on Draft EIS/EIR page 4.11-9, operations of the CD-IV Project would result in a marginal increase in vehicle trips that would not result in a long-term increase in ambient noise levels. Mitigation measures to reduce CD-IV Project-related vehicle noise are not warranted.

I11-24 The commenter indicates that the Draft EIS/EIR does not analyze existing odor effects or the possibility of a cumulative effect from additional wells. Analysis related to odor effects during construction and operation are presented on Draft EIS/EIR pages 4.2-10 and 4.2-11. As stated on Draft EIS/EIR page 4.2-13, odors would not be expected during normal operations because the geothermal fluid would be contained within a closed-loop heat exchanger system and reinjected back into the geothermal reservoir. In addition, Mitigation Measure AQ-4 is recommended to ensure that hazardous emissions concentrations related to release of H_2S during well testing are controlled (see Response A8-6).

I11-25 Please see Response A4-23.

I11-26 The commenter indicates that the Draft EIS/EIR should analyze the effect of crossing plowed roads. See Responses A4-7 and A4-9.

I11-27 The commenter indicates that access roads and additional plowing would increase usage of the area. As described on Draft EIS/EIR page 4.14-8, and included above in Response A4-7, some recreationists would prefer to use the roads under the CD-IV Project that have more maintenance (i.e., fewer ruts, smoother surfaces), while other recreationists seeking a more rustic experience would prefer the less maintained conditions of roads that currently exist. The effects of changes in recreation use resulting from the Proposed Action was described on EIS/EIR pages 4.14-7 and 4.14-8 and **Mitigation Measure REC-3**, included in the EIS/EIR, would require that information regarding access routing

be provided at nearby recreation sites / campgrounds, access points, and the Mammoth Welcome Center. In addition, operational vehicle speeds would be limited to 15 miles per hour and road signage would be installed, consistent with USFS and County requirements.

I11-28 The recreation analysis in the Draft EIS/EIR does not anticipate that relocation of trails or trailheads would be required as a result of the Project, nor that the Project would result in increased need for road maintenance or plowing by the Town of Mammoth Lakes or USFS. As described in Section 2.2.7.3, *Access Road Maintenance and Plowing*, the Applicant would undertake access road maintenance and plowing at its expense. Additionally, Mitigation Measure REC-3 requires the Applicant to coordinate with the Town of Mammoth and the USFS to ensure that the OSV staging area, and road access to the staging area, is plowed during winter.

I11-29 See Response I11-28. Because it is not anticipated that the Project would result in direct or indirect costs to the Town of Mammoth Lakes or to the USFS, no analysis of such costs has been prepared for this EIS/EIR.

I11-30 The report (*Economic Benefits of the Proposed Casa Diablo Geothermal Power Plant*, Wahlstrom & Associates, 2012) has been provided in Appendix G of the Final EIS/EIR for clarification. This report was provided by the Applicant and independently reviewed by the BLM, USFS, and GBUAPCD and their NEPA and CEQA contractor.

I11-31 The commenter indicates that the expense of recreational users switching to activities in entirely different areas should be considered. As discussed on Draft EIS/EIR page 4.14-11, as a result of the Propose Action some recreationists may instead use other similar regional recreational facilities and roads/trails, resulting in occasional increases in use of other recreational facilities and roads/trails. Given the availability of recreation opportunities in the region, such as the hundreds of miles of NFSRs and unauthorized roads, increased use of regional recreational facilities and roads/trails would not result in substantial use of other resources. However, due to altered recreational conditions in the Shady Rest area, some minor localized economic indirect effects could occur if recreational use habits change. See the text revision included in response to Comment I6-6.

Letter I12 – Responses to Comments from Center for Biological Diversity

I12-1 See Common Response 2, Recirculation, in Section 6.4.3.

I12-2 The commenter is referred to Responses I11-1 through -31 for responses to the Sierra Club.

I12-3 The comment states that the Draft EIS/EIR fails to address potential impacts to Owens tui chub, its designated critical habitat, and its recovery needs. Indirect impacts to Owens tui chub and its habitat are discussed in the Draft EIS/EIR (pages 4.4-13 and 4.4-14), including

potential impacts to habitat at the Hot Creek State Fish Hatchery. Potential impacts to Owens tui chub from operation of the Proposed Action and Alternatives is discussed and considered in the Draft EIS/EIR (pages 4.4-8, 4.4-13, 4.4-14, and 4.4-19). As analyzed in the Draft EIS/EIR, the Proposed Action and Alternatives would avoid any direct impacts to Owens tui chub habitat. The Draft EIS/EIR explains that there is no Owens tui chub habitat in the Project area. The recovery needs of the Owens tui chub are not the responsibility of the Project. See Response A9-2.

I12-4 The comment was given the subheading "The Draft EIS/EIR fails to identify and analyze potentially significant impacts to the Owens tui chub and its designated critical habitat" in the comment letter. The detailed comment under this subheading asserts that the area analyzed for potential effects on Owens tui chub was insufficient because it did not include the Hot Creek Fish Hatchery Springs. This assertion is incorrect, the Draft EIS/EIR does consider the Hot Creek Fish Hatchery Springs in its analysis, which serves as the basis for impact conclusions related to Owens tui chub impacts. The Draft EIS/EIR analyzes the potential effect of geothermal production on the thermal contribution to these springs and the overall effect on springs temperature. The comment incorrectly states that the Draft EIS/EIR notes that Hot Creek Fish Hatchery Springs will experience a decline of about 17 percent but fails to analyze the effect of this decline. On page 4.7-7, the Draft EIS/EIR states that thermal outflow to Hatchery Springs is forecast to be reduced by 17 percent, however, thermal water contributes only about 5 percent of the total flow of Hatchery Springs, therefore the thermal water contribution is forecast to be 4.15 percent of the total flow – a reduction of less than 1 percent of the total flow – following 30 years of project operation. The Draft EIS/EIR states that the potential temperature change at Hot Creek Fish Hatchery resulting from the forecast temperature and flow declines would not likely be measurable relative to climatic effects and would be further minimized by conductive buffering from hot rocks beneath the surface. See also the Response I14-22 for additional information regarding temperature calculations. See also Response A9-2.

I12-5 The comment states that the small Project study area may underestimate impacts to several special status species, including Sierra Nevada yellow-legged frog, Yosemite toad, Lahontan cutthroat trout and Piute cutthroat trout, and that additional environmental review is needed.

The CNDDB reports populations of Sierra Nevada yellow-legged frog and Yosemite toad about 4.7 miles west of the Project area, near Lake Mary. Generally, habitat for these amphibians does not occur on low-lying valley floor portions of the Project area. All known and potential habitat for Sierra Nevada yellow-legged frog and Yosemite toad is located upslope from and sufficiently distant from the Project that no impacts are anticipated to these species. The Project is outside of the range of the Lahontan cutthroat trout and Piute cutthroat trout, and thus, impacts would not occur to these species (Moyle, 2002).

I12-6 The commenter states that the conclusions in the Draft EIS/EIR regarding impacts to Owens tui chub would trigger a "may affect" determination and consultation with the

USFWS under the Endangered Species Act. The Proposed Action and Alternatives are not expected to result in adverse impacts to Owens tui chub or its habitat. See Response A9-2.

I12-7 This comment states that the Draft EIS/EIR has not utilized the most recent LVHAC monitoring data. Refer to Response I11-5.

I12-8 The numeric model forecasts address the additional pumping from the geothermal system, including well sites to the east. As discussed above, the predicted decline in thermal outflow would reduce the total flow to the Hot Creek springs by less than 1 percent and temperature changes would be difficult to detect. As stated in the Draft EIS/EIR, these potential changes are not anticipated to have an adverse effect on the Owens tui chub habitat. See Response I12-22 for additional information. Regarding the concern that impacts to the Owens tui chub should be evaluated in more detail prior to consultation under the Endangered Species Act, the comment correctly asserts the BLM must consult with the USFWS to satisfy the requirements of the federal Endangered Species Act and the GBUAPCD must consult with the CDFW. However, consultation occurs once a single preferred alternative has been selected, as opposed to the suite of different alternatives that must be reviewed under NEPA and CEQA. As described in Draft EIS/EIR Section 6.2.3 and 6.2.4, the BLM and GBUAPCD will consult with the USFWS and CDFW, respectively and satisfy all requirements of both Endangered Species Acts. See also Responses I12-4 and I14-22.

I12-9 Refer to the Common Response 4, Hydrologic Monitoring in Section 6.4.3.

I12-10 The commenter states that early detection of changes in the springs associated with Hot Creek Fishery Springs is critical to ensure against catastrophic loss to Owens tui chub. PDM GEO-5 is designed to prevent, or mitigate, potential hydrothermal impacts to the Owens tui chub critical habitat, Hot Creek Hatchery and Hot Creek Gorge springs from geothermal operations conducted on federal geothermal leases in the Mono-Long Valley KGRA.

I12-11 The commenter states the Draft EIS/EIR also fails to address cumulative impacts to thermal water resources and the Owens tui chub. See Response A9-4.

I12-12 See Common Response 4, Hydrologic Monitoring in Section 6.4.3.

I12-13 The commenter states the Draft EIS/EIR fails to adequately address the Sierra Nevada Forest Plan Amendments standards and guidelines for the protection of aquatic, riparian and meadow ecosystems and associated species. The Draft EIS/EIR addresses potential impacts to these ecosystems (pages 4.3-8, 4.3-11, 4.3-12, 4.3-13, and 4.3-14) and associated species (pages 4.4-13 and 4.4-14) and provides PDMs and mitigation measures to minimize those impacts (PDMs BIO-2, HYD-1 through HYD-7, and GEO-5; and mitigation measure VEG-1), in conformance with Sierra Nevada Forest Plan Amendments standards and guidelines.

I12-14 The commenter states the Draft EIS/EIR fails to adequately address the Sierra Nevada Forest Plan Amendments goals of species viability and special habitats. The SNFPA goal for species viability is adequately met through the analysis and protection measures in the Draft EIS/EIR. It is not expected that the Draft EIS/EIR will impact special habitats.

I12-15 The comment notes that the CD-IV Project and each of the alternatives include the same amount of water pumping and the same layout of wells, concluding that the Project needs to include a reduced water use alternative. The proposed power plant would use a binary system as described in Section 2.2.7.6, where the geothermal brine used for production would be reinjected into the geothermal reservoir in a different location (injection wells). The commenter expresses concern about the use of wells on the east side of the valley, it should be noted that wells 55-32 and 65-32 would be used only for injection. The Draft EIS/EIR considered a reduced power alternative but concluded that it should not be carried forward for analysis for reasons described in Section 2.8.2.

I12-16 The comment states that monitoring protocols must be in place to protect Owens tui chub and support species' recovery.

As analyzed in the Draft EIS/EIR, the CD-IV Project is forecast to reduce the combined cold and thermal outflow to Hatchery Springs by less than 1 percent, which is indiscernible relative to background climatic effects on water flow (Draft EIS/EIR page 4.4-13). As stated in the Draft EIS/EIR, approved operations and monitoring plans that are subject to the requirements of BLM, USFWS and the Long Valley Hydrologic Advisory Committee are presently designed to prevent, or mitigate, potential hydrothermal impacts to the Owens tui chub critical habitat, Hot Creek Hatchery and Hot Creek Gorge springs from geothermal operations conducted on federal geothermal leases in the Mono-Long Valley KGRA. Because the proposed geothermal Project would have negligible effects on flows and would operate in conformance with these requirements, no impacts are anticipated to Owens tui chub or designated critical habitat for this species.

I12-17 The comment explains that a project must consider a range of alternatives and the Draft EIS/EIR should explain why a reduced power alternative was rejected. The Draft EIS/EIR considered a reduced power alternative but concluded that it should not be carried forward for analysis for reasons described in Section 2.8.2.

I12-18 The comment states that the analysis fails to include mitigation that corresponds to the groundwater and surface water monitoring programs that would be expanded upon approval of the Project.

See Common Response 4, Hydrologic Monitoring, in Section 6.4.3.

I12-19 The comment states that the Draft EIS/EIR fails to include mitigation measures for impacts to thermal water resources or Owens tui chub habitat and does not mention the need for additional monitoring. See Common Response 4, Hydrologic Monitoring, in Section 6.4.3.

I12-20 The commenter asserts that the Draft EIS/EIR should be recirculated as a result of impacts to thermal resources and the Owens tui chub. The commenter is referred to comment Responses A9-2, A9-4 and I9-23 for responses regarding the adequacy of Tui Chub impacts analysis. In addition, see Common Response 2, Recirculation in Section 6.4.3.

Letter I13 – Responses to Comments from Friends of Inyo

I13-1 The commenter indicates that recreational and land use planning efforts in the region should be considered in the impact analysis. See Response I10-3 to I10-7.

I13-2 The commenter offers support for air resources Mitigation Measures AQ-1 and AQ-3. This comment is noted.

I13-3 The commenter states support for the use of recycled or gray water for the process of removing soil and plant parts from equipment and vehicles as part of PDM BIO-4. See Common Response 3 in Section 6.4.3 and Mitigation Measure VEG-2. Comment noted.

I13-4 The commenter states support for Mitigation Measure VEG-3. Comment noted.

I13-5 The commenter states that PDM BIO-8 does not identify "appropriate weed control measures". The commenter also asks if herbicides will be used as a weed control measure. See Common Response 3 in Section 6.4.3. This PDM is supplemented by Mitigation Measure VEG-2, which provides a greater level of detail as to what types of weed control measures will be implemented. Herbicide use is not proposed as a weed control measure as part of the Project.

I13-6 The commenter states that monitoring programs for invasive plant species should be extended to five years after Project completion and decommissioning. See Response I3-13.

I13-7 As shown in Figure 4.2, Figure 4.3, and Figure 4.4, proposed deer crossing locations are provided at approximately every 300 to 600 feet at existing roads, with some crossing sites ranging up to 1,200 feet apart. The crossing intervals that are stated in the Draft EIS/EIR are consistent with those suggested in the comment.

I13-8 See Response I14-40, which revises the components of the Migratory Deer Monitoring Plan required by Mitigation Measure WIL-6. Remote monitoring at camera stations shall be provided in lieu of transect or tracking surveys.

I13-9 As identified in Responses I3-9 andI9-35, vertical expansion loops would be reduced or eliminated and underground segments would be provided at regular intervals to provide deer passage. Thus, the proposed underground pipelines will facilitate movement by wildlife and recreational users.

I13-10 The commenter states that the Project should conform to construction limitations during bird nesting seasons, and that conformance with the Migratory Bird Treaty Act and the

Bald and Golden Eagle Protection Act are essential. Protections for nesting birds are outlined in Mitigation Measure WIL-1, which limits certain construction activities during the breeding season for birds or requires pre-construction nesting bird surveys. All applicable laws and regulations, including the Migratory Bird Treaty Act and the Bald and Golden Eagle Protection Act, will be adhered to.

I13-11 See Response I14-40.

I13-12 The commenter states support for Mitigation Measure WIL-1 through WIL-7, while stating that WIL-4 should include more than one deer crossing opportunity. Comment noted. Mitigation Measure WIL-4 is designed specifically for a known deer migratory corridor. Other deer crossing opportunities are designed into the Project's pipeline corridors (see Mitigation Measure WIL-5 and Figure 4.4-5).

I13-13 The commenter states that monitoring programs for wildlife resources should be extended to five years after Project completion and decommissioning. The monitoring programs as designed are adequate.

I13-14 The commenter appears to indicate that additional Project design measures and mitigation measures should be required to reduce greenhouse gas (GHG) emissions. However, as disclosed on Draft EIS/EIR page 4.5-8, the sum of annual operation GHG emissions (including direct and indirect emissions) and the amortized construction and decommissioning GHG emissions would be up to 505 metric tons CO_2e per year, which would be below the USEPA's GHG mandatory emissions reporting threshold of 25,000 metric tons per year, and below the CEQA significance threshold of 10,000 metric tons per year. In addition, the CD-IV Project would displace over 89,000 metric tons of CO_2e annually, resulting in a net reduction of over 88,000 metric tons CO_2e per year. It would not be reasonable to require additional mitigation measures to reduce GHG emissions.

I13-15 Avoidance of cultural resources is the approach developed in the Historic Properties Avoidance Plan. Language in Section 4.6 is altered to reflect the creation of a Historic Properties Avoidance Plan, as outlined in the Memorandum of Agreement. *All relevant text changes included in Response I8-6, above.*

I13-16 The comment incorrectly states that the Project would effectively triple the rate of groundwater pumping. As stated on Draft EIS/EIR page 4.7-3, the CD-IV Project would expand production by about 6,000 gallon per minute (gpm) to produce a total of 18,000 gpm from the reservoir (12,000 gpm is currently produced by the existing plants). This represents a 50 percent increase in the rate of geothermal production. While the Project area is located in a volcanic region and earthquakes and other volcanic events could occur, it is unlikely that those types of events would have a substantial effect on forecasting models, baseline information on the geothermal resource or the underlying "geomorphic makeup". Existing LVHAC hydrologic monitoring programs would continue to evaluate potential changes related geothermal resource extraction.

I13-17 Refer to the Common Response 4, Hydrologic Monitoring in Section 6.4.3.

I13-18 The commenter is referred to Common Response 4, Hydrologic Monitoring in Section 6.4.3, also to the discussion of revegetation measures in Draft EIS/EIR Section 4.3.

I13-19 The comment recommends that PDM LU-1 be expanded to include the use of paint on the pipeline so that it blends in with the surrounding landscape. The comment also supports use of landscaping as opposed to fencing to reduce visual effects because fencing could be viewed as a potential barrier to wildlife and recreationists.

As described on page 4.18-5, PDM VIS-3 would require that segments of the geothermal pipeline that are constructed "(a) in areas with a VQO of "retention" in the vicinity of Sawmill Cutoff Road, and (b) in Inyo National Forest managed-land in areas with the VQO of "retention" and visible from SR 203 and/or U.S. Highway 395 will use texture and color or colors (approved by the authorized officer) selected to blend with the color and texture of the characteristic landscape." Implementation of PDM VIS-3 would address the commenter's concern. With regard to the commenter's request to use landscaping as opposed to fencing, PDM LU-1 has been removed from the EIS/EIR (see Response I8-32).

I13-20 The Mammoth Lakes Trail System Master Plan and Shady Rest Park are discussed extensively in Sections 3.14/4.14, *Recreation*. Mitigation measures listed on page 4.14-15 of the Draft EIS/EIR and PDMs relevant to recreation listed on pages 4.14-2 through 4.14-3 would reduce or avoid adverse impacts to Shady Rest Park and other recreational facilities.

I13-21 Cumulative impacts resulting from projects listed in Table 4.1-1 are discussed within each resource analysis section of the Draft EIS/EIR. For example, cumulative impacts regarding Air Resources are discussed in Section 4.2.8, *Cumulative Impacts*. PDMs and Mitigation Measures that would reduce effects related to cumulative impacts are similarly listed in the applicable resource section of Chapter 4, *Environmental Consequences*.

I13-22 The commenter asks if nighttime noise levels were measured for ambient operating noise of wells and the nearby campgrounds. Although not collected at nighttime, ambient noise measurements of existing Well 57-25 were obtained to represent proposed well pump noise at all hours (see Draft EIS/EIR pages 4.11-8 and 4.11-9). No noise measurements were collected at the campgrounds. The measured noise level of 58 dBA at 100 feet from the well pump is used in the Draft EIS/EIR as the reference noise level for proposed well pumps that would be associated with the CD-IV Project.

I13-23 The commenter indicates that it would be good to include more mitigation for operating noise levels and refers to the next comment. This comment is noted. Also, refer to Response I13-24.

I13-24 The commenter suggests that mitigation should be required to reduce operational noise levels associated with the proposed well pumps and the power plant facilities. With regard

to well pumps, the Draft EIS/EIR discloses that noise levels from the well pump at Well Site 38-25 would likely be audible at the baseball fields at Shady Rest Park, but would not be expected to be disruptive to point that mitigation would be required, and pump noise levels at other sensitive receptor locations would not be expected to be audible (see Draft EIS/EIR page 4.11-8; and for additional discussion related to the effects of proposed well pump noise at Shady Rest Park refer to Responses A4-18 through A4-21). As stated on Draft EIS/EIR page 4.11-7, power plant facilities noise would also not be expected to be audible at the nearest noise receptor locations. The need for operations-related noise mitigation measures has not been identified.

I13-25 The commenter defers comments related to recreation to those provided by Mammoth Lakes Trails – Public Access (MLTPA). This comment is noted. See the responses to MLTPA comments.

I13-26 Comment is noted. The commenter is referred to Common Response 4, Hydrologic Monitoring in Section 6.4.3 for a discussion of geothermal resource monitoring. Additionally, the Draft EIS/EIR identifies several PDMs and Mitigation Measures that include monitoring components to address identified impacts. If the CD-IV Project is approved, the applicant will need to comply with all monitoring components identified in the EIS/EIR and any additional requirements included as permit conditions.

I13-27 See Common Response 4, Hydrologic Monitoring in Section 6.4.3.

I13-28 Section 2.2.6.2 of the Draft EIS/EIR discusses the wellfield construction and state that "…drilling would continue until sufficient production and injection capacity is reached to support the project…" The Project is defined as a net 33 MW power plant. Because well field development is reliant upon modeling and well testing, the Draft EIS/EIR took the conservative approach of assuming full development in order to capture all potential impacts. As described in the Draft EIS/EIR, wells 12-15 and14-25 have been drilled for exploration, and depending upon testing results could be used for the CD-IV Project. Although not used for the Draft EIS/EIR analysis due to uncertainty, ORNI 50 has identified five wells sites and likely being their preferred development wells if the Project is approved. These would be 12A-31, 23-31, 26-30, 55-32, and 65-32 (ORNI 50 LLC, 2013). If the Project is approved, the BLM could specify an order of development in the ROD.

Letter I14 – Responses to Comments from Laborers International Union of North America (LIUNA)

I14-1 The commenter states that the Draft Joint EIS/EIR contains numerous errors and omissions that preclude accurate analysis of the CD-IV Project but does not provide details which would allow for a detailed response. Subsequent detailed comments are responded to individually.

I14-2 This is a summary comment in which the commenter states that they support renewable energy, including geothermal power if the Project avoids impacts to sensitive species and

habitats. They further state that the EIS/EIR must be revised and recirculated but does not provide details which would allow for a detailed response. See Common Response 2, Recirculation in Section 6.4.3.

I14-3 The commenter describes the standing of the members of LIUNA Local 783 in this process. This comment is noted.

I14-4 The commenter states issues identified in their letter apply to both NEPA and CEQA, as well as other relevant laws. This comment is noted.

I14-5 The commenter suggests that the Draft EIS/EIR fails to take a hard look at the environmental impacts of the proposed action in accordance with NEPA and CEQA, however no specific shortfalls were cited in the comment letter. The Draft EIS/EIR provides an adequate discussion of the environmental consequences, including the cumulative impacts, of the Proposed Action and Alternatives. As required by 40 CFR 1502.16 and CEQA Sections 15125 and 15126, the Draft EIS/EIR provides a discussion of the environmental setting (Chapter 3 by resource section), environmental impacts (Chapter 4 by resource section), mitigation measures (Chapter 4 by resource section), any adverse environmental effects which cannot be avoided should the proposal be implemented (Chapter 4 by resource section), the relationship between short-term uses of man's environment and the maintenance and enhancement of long-term productivity, and any irreversible or irretrievable commitments of resources which would be involved in the proposal should it be implemented (Chapter 4 by resource section). The Draft EIS/EIR presents the decision-maker with sufficiently detailed information to aid in determining whether to proceed with the CD-IV Project or make a reasoned choice among the other alternatives in a manner such that the public could have an understanding of the environmental consequences associated with the alternatives, in accordance with 40 CFR 1502.1.

I14-6 This summary comment introduces the issues and claims in Comments I14-7 through I14-27. Please refer to those individual comment responses. Also see Response I9-49 and Section 4.7.8 for an analysis of the potential cumulative impact of the CD-IV Project on geothermal resources.

I14-7 This comment, providing background information regarding the MCWD supplies, is noted.

I14-8 The commenter states that the Draft EIS/EIR fails to analyze the potential seismic activity and regional geologic activity that could create a significant risk of contamination of groundwater resources from leakage or mixing of geothermal extraction fluids. The commenter appears to have a general misunderstanding of the groundwater and geothermal aquifers in Long Valley. Although the commenter correctly states that water production wells are located in the western part of the groundwater basin (assumed to refer to the groundwater basin for cold, drinking water resources), the comment incorrectly continues that "the groundwater basin underlies *both* the water and geothermal wells." Drinking water wells in the shallow groundwater aquifer used by MCWD extend to a depth of 400 feet,

while the proposed wells in Basalt Canyon would tap a much deeper aquifer of heated geothermal waters located at depths of up to 2,500 feet. These resources are separated by more than 1,200 feet. As discussed in the Draft EIS/EIR (refer also to Common Response 4, Hydrologic Monitoring in Section 6.4.3), these aquifers are physically separate by stratigraphy and widespread low permeability layers that greatly reduce the potential for mixing of these fluids. Basic hydrogeologic principles indicate that leakage from the lower geothermal aquifer, if any were to occur, would flow downgradient rather than up towards the drinking water aquifer.

See Response I14-27 regarding the potential for seismic activity resulting from Project operation.

I14-9 The commenter states that the Project could result in increased risks to groundwater from hazardous materials. The Draft EIS/EIR Sections 4.13 and 4.19 address the potential impact of hazardous materials releases to affect shallow groundwater. The applicant would comply with all local, state, and federal regulations regarding the use, transport, storage, and disposal of hazardous materials and wastes. The Hazardous Materials Business Plan (HMBP), which the applicant is required to have on file in order to operate the plant, would be updated to incorporate the new power plant. As discussed, the Project would comply with the procedures outlined in its HMBP, Emergency Contingency Plan, a Well Blowout Contingency Plan, and a Spill or Discharge Contingency Plan. Given the high degree of state and federal regulations surrounding hazardous materials storage and use, the potential for an accidental surface release to infiltrate the subsurface to substantially affect groundwater quality is low.

Please refer to the Response I9-50 regarding the potential for contaminants in injection fluid to affect the drinking water aquifer.

I14-10 As stated in the comment and the Draft EIS/EIR Section 3.8, no major earthquakes (those with magnitudes above 5) have occurred that were linked to injection of geothermal fluid have been reported in California and none are expected under the CD-IV Project. Geothermal operations can sometimes result in microseismicity as discussed in further detail in Response I14-27.

I14-11 The comment asserts that impacts to the overlying shallow groundwater systems show early signs of mixing and the impact to the environment and natural resources from the 50 percent production increase under the CD-IV Project has not been adequately addressed in the Draft EIS/EIR. Overall, the commenter does not present any new evidence that contradicts or challenges the analysis in the Draft EIS/EIR. Contrary to the comment's claim, the analysis of the CD-IV Project's effects on groundwater resources, as presented in the Draft EIS/EIR, was adequate to determine whether there would be an impact to groundwater sources from operation of the Project. As stated in the Draft EIS/EIR, Sections 3.7 and 4.7, available evidence indicates that the shallow Mammoth Groundwater Basin is physically isolated from the deeper geothermal system and therefore, the CD-IV Project would be unlikely to affect the availability or quality of shallow groundwater

resources in the Project vicinity. No effects on the shallow cold water basin have been observed during monitoring of the 27 years of operation of the existing Casa Diablo facilities. Further, even if there are connections, the forecast pressure declines are unlikely to cause adverse impacts to the overlying groundwater system. Producing from the deeper Basalt Canyon geothermal reservoir proposed under the CD-IV Project would have less potential to adversely affect shallow groundwater resources. Furthermore, current groundwater quality and quantity are within acceptable drinking water standards. The commenter asserts that sampling results in Well P-17 indicates a "decent connection" between the geothermal reservoir and shallow groundwater and that mixing has already occurred. This appears to be an oversimplification of the findings in the Draft EIS/EIR, which concluded that the very low concentrations of chloride (2 to 5 mg/L) detected in samples from one isolated well (Well P-17) provide inconclusive evidence of a contribution of geothermal water in this one well; however, if the source of the chloride is thermal water, the maximum thermal contribution to the groundwater would be very small (1-2 percent). Available geochemical and temperature data from a single well (Well P-17) is not adequate to support a conclusion that there is a "decent connection" between the geothermal reservoir and shallow groundwater.

I14-12 Please refer to the response to Comment I14-11 and Common Response 5, Groundwater Resources in Section 6.4.3 regarding the separation of the geothermal reservoir and groundwater aquifers.

I14-13 The comment asserts that the Draft EIS/EIR does not assess the potential for a release of "hazardous contamination" to affect the MCWD groundwater basin based on setting information presented on page 3.7-14. Section 3.7 presents setting information; impact analyses related to this topic are presented in Draft EIS/EIR Sections 4.7 and 4.13. The comment states that while the Draft EIS/EIR identifies the location of proposed geothermal production and injection wells relative to MCWD drinking water wells, it fails to identify the location of pipelines. Because pipelines connect the geothermal wells and the power plan, all Project pipelines would also be located to the east of Section C-C' on Figure 3.7-5. It is not understood what the comment means by the "natural mixing of groundwater in the basin" and how that relates to the geothermal aquifer. As discussed in the Draft EIS/EIR, the cold groundwater and geothermal aquifers are separated by over 1,200 feet, including low permeability layers. Please refer to Response I14-9 regarding the potential impact of a hazardous materials release to affect groundwater quality.

I14-14 Refer to Response A10-38.

I14-15 The comment asserts that the release of hazardous chemicals from leakage of geothermal motive fluids is analogous to the risks of chemical dispersion from fracking. The potential impact of leakage of motive fluids into the injection wells is in no way analogous to "fracking" for petroleum product extraction. Please refer to Response I9-49 regarding the potential effect of a motive fluid release on related hydrothermal resources. Because brine is injected into the geothermal aquifer more than one mile east and 1,200 feet below the

groundwater aquifer and, as discussed in the Draft EIS/EIR, the cold groundwater aquifer is separated by impermeable layers from the deeper geothermal aquifer, the potential impact of leakage of motive fluids on groundwater resources is low.

I14-16 Refer to Response 114-15.

I14-17 The commenter states that the Proposed Action and Alternatives are likely to result in significant impacts to water quality derived from hazardous substances as well as stormwater. This summary comment introduces the ideas in Comments I14-18 through I14-21. Please refer to the responses to those comments.

I14-18 The comments asserts that there is an increased risk of isobutene releases to the environment from the Project. As discussed in Section 3.7.1, isobutane releases have provided a convenient tracer test showing the connection between the geothermal reservoir and some of the shallow hydrothermal features to the east of Casa Diablo. Only a few releases have occurred within the nearly 30 years of existing geothermal operations. Trace concentrations were detected in the hot springs and these concentrations decreased exponentially with time, as isobutane readily volatizes into air; therefore, potential impacts on surface hydrothermal features are short-lived, rather than "continued and long-lasting impacts of mismanaged chemicals" as stated by the commenter. Refer also to Response I9-49.

I14-19 The commenter states that the Draft EIS/EIR fails to adequately address potential water quality impacts to Mammoth Creek due to construction activities and the installation of new well pads and roads. Potential water quality impacts as a result of implementing the Proposed Action and Alternatives, including from construction activity and road installation, are analyzed in the Draft EIS/EIR (see Section 4.19.4.1, *Direct and Indirect Impacts,* and Section 4.19.4.2, *CEQA Significance Determination*). Further, cumulative water quality impacts are also addressed in the Draft EIS/EIR (see Section 4.19.8, *Cumulative Impacts*).

I14-20 The commenter states that the Project would increase the risk for release of hazardous materials into the surface water resources. A release of n-pentane, a liquid petroleum gas (as described on Draft EIS/EIR page 3.13-1) would result in n-pentane vaporizing into the air rather than spill onto the ground and potentially impact surface water. Other bulk hazardous materials including fuels and lubricants would be stored at a maintenance building and oil storage area shared with the existing Casa Diablo facilities. All materials considered as hazardous would be stored in accordance with the Hazardous Materials Business Plan that the facility is required to maintain under state and federal law. In addition, hazardous material storage areas would have secondary containment features, as required by law. Within the wellfield, only one 55-gallon drum of lubricating oil would be stored at each well. Drums would be stored within drip pans and while the potential for rupture of these drums could result in a localized and manageable release of oil, the potential for rupture is low. All chemical releases would be managed in accordance with standard best management practices and clean-up procedures as set forth in the spill

management plans. Section 4.13.4.1 adequately addresses the potential risk of hazardous materials releases.

I14-21 Please refer to Responses I14-9 and I14-20 regarding the Draft EIS/EIR analysis of the potential for hazardous materials to contaminate both groundwater and surface water. The Draft EIS/EIR, Sections 3.13 and 4.13 presents sufficient background and analysis to reach the conclusion that while hazardous materials may be transported and used under proposed Project operations, they would not present a significant impact to the environment. The Project Design Measures (PDM) proposed as part of the Project and Mitigation Measures proposed in the Draft EIS/EIR provide adequate protection to the environment from hazardous materials use.

I14-22 This summary comment states that the Draft EIS/EIR does not provide an adequate analysis of potential impacts to nearby geothermal resources. The Draft EIS/EIR Section 4.7.4.1 describes the potential impacts on sensitive geothermal features. It concludes that, based on model forecasts, the temperature of thermal discharge from the Casa Diablo area may decline between approximately 11-18°F. At the Fish Hatchery Springs, the thermal discharge to the springs may decline up to 17 percent. The Draft EIS/EIR states that the combined effect of the reduced temperature and flow would not likely be measureable relative to climatic effects and would be minimized through conductive buffering, and, therefore, would be difficult to detect. Further information regarding the Draft EIS/EIR impact analysis is presented below for clarification in response to the comment.

At the Fish Hatchery Springs, the portion of thermal discharge (Y, thermal flow/total flow) currently makes up approximately 5 percent of the total water discharge. Assuming that the springs discharge is a mixture of thermal outflow from Casa Diablo and non-thermal water, a simple chemical mass- balance for chloride (Cl) can be used to estimate the fraction of thermal water, Y (Sorey and Farrar, 1988; Sorey and Sullivan, 2006). This simple chemical mass balance is the fraction of thermal water times the Cl concentration in thermal water plus the fraction of non-thermal water plus the Cl concentration in non-thermal water gives the Cl concentration in the spring water:

$$Y \times Cl_{thermal} + (1-Y) \times Cl_{non\text{-}thermal} = Cl_{measured\text{-}spring}$$

Rearranging,

$$(Cl_{measured\text{-}spring} - Cl_{non\text{-}thermal})/(Cl_{thermal} - Cl_{non\text{-}thermal}) = Y$$

The USGS has monitored the chemistry, flow, and temperature of the Fish Hatchery Springs monthly from 1998 through 2013, as part of the LVHAC hydrologic monitoring program and the data is readily available (at www.USGS.gov). Using these data for the highest temperature Fish Hatchery Spring "AB", the mass flow of thermal water at the springs was estimated to be between 2 percent and 7 percent (on average 5 percent; Sorey and Sullivan, 2006). The percent of thermal water discharge in Fish Hatchery Springs is shown on LVHAC hydrologic monitoring data (included as exhibits to Letter I12). Based

on changes in reservoir pressures, the reservoir model predicts that the thermal discharge may decline 17 percent, or from 5 percent to 4.15 percent of the total flow. Assuming the initial temperature of the thermal water discharge is approximately 338°F (170°C) and the average non thermal water temperature is 50°F (10°C), and the discharge of thermal water (Y, thermal water/total discharge) is 5 percent and non-thermal water is 95 percent, the observed temperature could be determined as follows using a simple mass and energy balance (equation from Sorey 2005, Sorey and Sullivan, 2006) where Y is the fraction of thermal water and T is the temperature:

$$Y \times T_{thermal} + (1-Y)T_{non\text{-}thermal} = T_{measured\text{-}spring}$$

$$(0.05 \times 338°F) + (0.95 \times 50°F) = 64.4°F\ (18°C).$$

If the thermal discharge at Fish Hatchery Springs declines *both* in mass flow by 17 percent and in temperature the maximum of 18°F, the temperature in the spring discharge can be represented by the following:

$$((0.0415/(1.0-0.0085)) \times 320°F) + ((0.9585/(1.0-0.0085)) \times 50°F) = 61.7°F\ (16.5°C).$$

Therefore, the maximum calculated temperature decline at the Fish Hatchery Hot Spring based on the numeric model predictions would be 2.7°F (1.5°C). This calculation is a conservative estimate that does not include other influences on the temperature of the springs, as discussed below.

Between 1988 and 2003, measured temperatures at the Fish Hatchery Springs AB ranged from approximately 60°F (15.5°C) to 64.4°F (18°C) (www.usgs.gov). Sorey and Sullivan (2006) attributed this range to variations in the seasonal and annual variations in the influx of cold water because the lowest temperatures correlate with the highest total mass flow rates. They further suggest that the influence of thermal water components on spring water temperatures estimated by these mass balance equations is conservative. In other words, the discharge temperature estimated by the Y calculated using the chemistry of the springs typically indicates a greater variation than is observed in measured temperatures of the springs.

Theoretically, if relative proportions of the thermal and non-thermal waters are the only factors affecting the measured values, the measured temperatures and temperatures calculated from Y values should be consistent within normal variation of data measurements. But a quantitative evaluation of the trends in measured and calculated temperatures and mass flows in the Fish Hatchery AB Springs by Sorey and Sullivan (2006) indicate that the calculated (using Y) and measured temperatures are not consistent. This suggests that measured temperatures are being affected by factors other than the portion of thermal discharge, specifically:

1. Heat transfer from the aquifer rock to the water and vice versa such that the rock temperature essentially "buffers" the discharge temperature,

2. Crustal unrest in Long Valley affects the system.

In summary, the conservative estimate of the potential impact of the CD-IV Project would be that the temperature of the combined thermal and non-thermal waters discharging at the hottest springs would have a maximum temperature decline of 2.7°F (1.5°C), although the actual decline would most likely be reduced for the reasons discussed above. This predicted temperature decline would be smaller than the measured temperature change observed between 1988 to 2003 of ~4.4°F (~2.5°C) which has been attributed primarily to differences in non-thermal water influx (i.e., annual rainfall and climatic variations). Therefore, the analysis presented in the Draft EIS/EIR was appropriately conservative.

I14-23 In general, the comment asserts that the proposed CD-IV Project has the potential of impacting and irreversibly altering the natural geothermal features in the vicinity of the Project. It must be noted that contrary to the commenter's understanding, temperature declines in the reservoir do not necessarily directly correlate to temperature declines in surface thermal features for various reasons described above (Response I14-22 related to the Fish Hatchery) and in Draft EIS/EIR Section 4.7.4.1. These include buffering of water temperatures by aquifer host rocks, and buffering of discharge temperatures by the boiling process.

Feed zones of thermal waters that discharge at Hot Creek and Hot Bubbling Pool, appear to be predominantly thermal water flowing laterally from the Casa Diablo reservoir with small (10 to 20 percent) contributions of non-thermal water. In both cases, the temperatures in the feed zones of the thermal features are above boiling. In the case of Hot Creek Springs, these waters will boil when they reach the surface. In the case of Hot Bubbling Pool, the water boils below the surface and steam reaches the surface. The temperature of the discharge is therefore controlled by the ***boiling temperature of water*** and will remain fairly constant as long as the temperature of the feed zone remains above boiling. Although a temperature decline of 11-18°F (5-9°C) in the thermal waters that discharge from the Casa Diablo reservoir is predicted from the numeric model, because the initial temperatures are approximately 338°F (170°C), the temperatures of the Hot Creek Springs and Hot Bubbling Pool will remain above boiling.

If the temperature of the thermal fluid feeding the Hot Creek Springs and Hot Bubbling Pool declines 11-18°F (5-9°C), it would decrease the amount of steam produced at the surface, as described in Draft EIS/EIR Section 4.7.4.1, by approximately 2 percent. However, the steam is primarily discharged to atmosphere and the boiling water discharges at the springs. The change in steam discharge is not anticipated to be significant and there is not expected to be a change in the hot spring temperatures.

I14-24 The comment expresses concerns regarding the proprietary numerical model and mass balance equation used to analyze the impacts of the CD-IV Project. The mass balance

equations used in the Draft EIS/EIR include all publically available data for the chemistry and temperatures of the wells and springs. Most of this data is collected as part of the Long Valley Hydrologic Monitoring Program (www.usgs.gov). Common Response 4, Hydrologic Monitoring in Section 6.4.3 describes the independent experts who reviewed the proprietary model in preparation of the EIS/EIR analysis.

Draft EIS/EIR Section 4.7.4.1 states that the thermal discharge from the Casa Diablo reservoir will decrease in temperature based on forecasts using a proprietary numerical model. The impact on thermal surface manifestations depends on the nature of the manifestations. If a surface manifestation feeds directly by thermal discharge from the Casa Diablo reservoir with minimal dilution, then the spring temperature is controlled by boiling, as for Hot Creek and Hot Bubbling Pool, as discussed above in Response I14-23. If the discharge of the spring is a mixture of thermal water and non-thermal water and the temperature of the mixture is below boiling, as at the Fish Hatchery, the non-thermal water component typically dominates spring flow and temperature as discussed above. Some temperature decline may occur depending on the relative contribution of the thermal component as also discussed above. See Responses I14-22 and I14-23.

The commenter states the Draft EIS/EIR does not adequately study the impacts of these lowered temperatures on the surrounding resources and ecosystems. The anticipated changes are minimal and within the range of variation that has been observed in the hot springs since monitoring began. The Draft EIS/EIR adequately addresses potential impacts to geothermal resources.

I14-25 The Draft EIS/EIR Section 4.7.8 analyzes the potential cumulative impact of the CD-IV Project.

I14-26 The commenter states that Draft EIS/EIR fails to adequately address the impacts of Project related subsidence and subsidence that occurs in combination with ground shaking events. The Draft EIS/EIR addresses subsidence and ground shaking to the degree necessary to identify the geologic and seismic hazards and analyze if those hazards could adversely impact the CD-IV Project. The Draft EIS/EIR Section 3.8.1.6 provides background information of subsidence in the Project area. That section then refers the reader to the analysis of subsidence in Section 4.8. Section 4.8.4.1 the Draft EIS/EIR (*Direct and Indirect Impacts*) provides a detailed analysis of subsidence and its effects on the Project (*Soils and Ground Instabilities).* The Draft EIS/EIR concluded that the Project would produce from a much deeper reservoir, which should mitigate the effect of changes in shallow aquifer conditions and altered alluvium/colluviums present at Casa Diablo. However, it concluded that there is a chance that increased pumping from the deeper reservoir could continue or increase the rate of subsidence occurring naturally and occurring as a result of existing pumping operations. In order to address the uncertainty regarding expected local subsidence rates, and to protect infrastructure and resources from potentially adverse effects, the Draft EIS/EIR proposed Mitigation Measure GEO-3. The commenter asserts that while the degree of subsidence would be minor, "when combined

with ground shaking events of the injection process" the result could lead to compromised equipment and release of hazardous materials. This assertion is unfounded. The Project elements would be designed to account for subsidence and to withstand seismic ground shaking as required by building codes. This is clearly described and analyzed in the Draft EIS/EIR Sections 3.8.and 4.8.

I14-27 The commenter states that the Draft EIS/EIR does not adequately analyze potential impacts from project-induced seismicity and does not analyze the Project's potential to generate earthquakes of a higher magnitude, especially in the Hilton Creek Fault Zone. The Draft EIS/EIR analyzed the potential for induced seismicity in Section 4.8 and concluded that the Project would have no adverse impacts on buildings and other structures in surrounding communities due to induced seismicity, if it were to occur. Long Valley is a seismically active area and swarms of earthquakes have occurred within and outside of the caldera during the period of seismic unrest following a series of M6± earthquakes in 1980. Given the high level of background seismicity in the region, induced seismicity directly related to geothermal activity has not been observed in the extensive records compiled from the regional and local seismic network established to monitor caldera unrest. Known induced seismicity within the caldera has been limited to remotely triggered swarms common to other hydrothermal systems. Seismic unrest within the caldera has declined since the 1990's. Few, if any microearthquakes are currently detected on regional or local USGS monitoring networks and none are directly related to geothermal development at Casa Diablo despite continued production and injection through and beyond the period of seismic unrest (EGS, 2012). There is no direct correlation between geothermal injection and the increased seismicity on the Hilton Creek Fault and attempting to correlate increased injection from the Project to increased earthquake magnitudes would be unfounded and speculative. Seismic hazards associated with the Hilton Fault Zone are discussed in Draft EIS/EIR Section 3.8.1.7.

I14-28 The comment is an introductory statement and it is understood that further elaboration is forthcoming in subsequent comments. The commenter is directed to Responses I14-30 through I14-52.

I14-29 The comment is another introductory statement and it is understood that further elaboration is forthcoming in subsequent comments. The commenter is directed to Responses I14-30 through I14-52.

I14-30 The commenter states disagreement with the conclusions of the "potential to occur in the Project Area" (Table 3.4-1) for bald eagle and golden eagle. Bald eagle is listed with a "Low" potential to occur, which means the Project site and/or immediate area only provide limited habitat for a particular species. The Project area provides poor quality suitable habitat for bald eagle due to its distance from any large bodies of water. They are unlikely to nest in at the Project site. Golden eagle is listed with an "Unlikely" potential to occur, which means the Project site and/or immediate area do not support suitable habitat for a particular species, or the Project site is outside of the species known range. The Project site

does not support nesting habitat for golden eagle, and there are no known nesting locations documented in the regional project area. Because of this, golden eagle are unlikely to use the Project site for nesting or foraging purposes.

I14-31 The commenter states disagreement with the conclusions of the "potential to occur in the Project Area" (Table 3.4-1) for greater sage-grouse, requesting that the potential to occur be categorized as "High". Greater sage-grouse is identified with a "Low" potential to occur, which means the Project site and/or immediate area provide suitable habitat for a particular species, and habitat for the species may be impacted. Though the Project area is just north of a known occurrence of this species, the area supports forested habitat that is generally avoided by this species. In order to be considered to have a "High" potential to occur, the Project site and/or immediate area provide ideal habitat conditions for a particular species and/or known populations occur in immediate area or within the potential area of impact. Because the habitat conditions within the Project site are considered unsuitable, sage grouse was determined to have a "Low" potential to occur.

I14-32 The commenter states disagreement with the conclusions of the "potential to occur in the Project Area" (Table 3.4-1) for prairie falcon, requesting that the potential to occur be categorized as "Moderate" or "High". Prairie falcon is listed with a "Low" potential to occur which means the Project site and/or immediate area only provide limited habitat for a particular species. The Project area provides poor quality habitat for prairie falcon, therefore a "Moderate" or "High" potential to occur is not warranted.

I14-33 The commenter states disagreement with the conclusions of the "potential to occur in the Project Area" (Table 3.4-1) for five species of bat: silver-haired bat, western red bat, long-eared myotis, long-legged myotis, and Yuma myotis. These species are listed with a "Low" potential to occur which means the Project site and/or immediate area only provide limited habitat for a particular species. While these species may potentially utilize the Project area for foraging, the lack of associated roosting habitat for these species limits their potential to occur to "Low". However, Final EIS/EIR Mitigation Measure WIL-9, as proposed above, will require pre-construction surveys for all special-status bat species.

I14-34 The commenter states disagreement with the conclusions of the "potential to occur in the Project Area" (Table 3.4-1) for Sierra Nevada red fox. Sierra Nevada red fox is identified with a "Moderate" potential to occur, which means the Project site and/or immediate area provide suitable habitat for a particular species, and habitat for the species may be impacted. The Project area provides suitable foraging habitat and limited denning habitat for this species. In order to be considered to have a "High" potential to occur, the Project site and/or immediate area provide ideal habitat conditions for a particular species and/or known populations occur in immediate area or within the potential area of impact.

I14-35 The commenter states that the Draft EIS/EIR does not include an analysis of American badger (*Taxidea taxus*) or mountain lion (*Puma concolor*). The list of special-status species analyzed in the Draft EIS/EIR was compiled based on data in the California Natural

Diversity Database (CDFG, 2012), the CDFW Special Animals list[3], and the USFWS List of Federal Endangered and Threatened Species that may be Affected by Projects in Mono County, CA (USFWS, 2012b). The USFWS List of Federal Endangered and Threatened Species that may be Affected by Projects in Old Mammoth, California quadrangle was also reviewed (USFWS, 2012a). American badger did not appear in the CNDDB as potentially occurring in the Project area; therefore it was not analyzed in the Draft EIS/EIR. Mountain lion does not meet the definition of "special-status species" used in the Draft EIS/EIR (page 3.4-3) and was therefore not addressed in the Draft EIS/EIR.

I14-36 The comment is a concluding statement. The commenter is directed to Responses I14-30 through I14-35.

I14-37 The commenter states that the Draft EIS/EIR does not discuss the Project's contribution to habitat fragmentation and movement corridors. Habitat fragmentation is discussed in association with mule deer migration (see pages 4.4-14 through 4.4-19).

I14-38 The commenter states that the Draft EIS/EIR fails to adequately evaluate cumulative impacts of the Project on special-status species, and states that the Draft EIS/EIR should have included a number of maps showing existing and conceivable future development. The Draft EIS/EIR discusses cumulative impacts on biological resources (Sections 4.3.8 and 4.4.8). The scope of the cumulative impact is discussed in Section 4.1.5.

I14-39 The commenter states the Draft EIS/EIR fails to incorporate all feasible mitigation measures, as required by CEQA, to lessen the Project's significant impacts on species. The mitigation measures included in the Draft EIS/EIR would reduce impacts to special-status species to a less-than-significant level.

I14-40 The commenter states that PDM BIO-1 does not provide sufficient details regarding determining impedance of wildlife movement caused by the pipelines. It also requests additional monitoring details. In response to this comment, Mitigation Measure WIL-6 is revised as follows:

> **Mitigation Measure WIL-6:** ORNI50, LLC shall prepare and implement a Migratory Deer Monitoring Plan that meets the approval of BLM and USFS. The objective of the Migratory Deer Monitoring Plan shall be to monitor the pipeline routes for evidence of movement corridors not currently identified. The migratory deer monitoring shall follow the methodology used for the deer track crossing studies performed in 2011 (Paulus 2011a; 2012a; 2012b). If previously unidentified movement corridors are found during monitoring, remedial actions, such as installation of earthen ramps over the pipeline, shall be implemented in order to facilitate deer crossings. <u>The Monitoring Plan will also include details regarding methodologies to determine if the pipeline corridors are impeding wildlife</u>

[3] The CDFW Special Animals List, also referred to as the list of "species at risk" or "special status species", identifies all animal taxa that the CNDDB is interested in tracking, regardless of their legal or protection status. The list is available online at: www.dfg.ca.gov/biogeodata/cnddb/pdfs/spanimals.pdfSimilar

movement (per PDM BIO-1) (e.g., if tracks do not cross designated crossing areas), and shall include remedial actions if impedance of wildlife movements is detected, or if the various measures proposed to promote deer crossings are not being utilized by migrating deer (e.g., installing at-grade or similar crossing structures). The Monitoring Plan shall also include performance measures for determining if the various deer crossing measures proposed are meeting their goals. At a minimum, monitored elements shall include: 1) a pre- and post- construction deer movement study that employs remote camera stations that is capable of determining whether or not deer use remains relatively constant or declines measurably following construction; 2) an assessment of available crossing sites to determine whether or not deer are using the provided above ground or underground sections; and 3) the success of any remedial actions, if needed (for example, the success of additional created at-grade structures), to facilitate deer movement through the Casa Diablo complex. As a result of post-project monitoring studies, any indications that changes to the environment resulting from the Project result in significantly greater (e.g., >25 percent above baseline) vehicle-related mule deer mortality or significantly reduced on-site deer population size or habitat use that cannot otherwise be explained by environmental factors shall warrant the incorporation of additional measures such as the one-by-one construction of at-grade or similar deer crossing structures at key locations to reduce impacts on deer movement.

I14-41 The commenter states that thresholds of success as well as measures of effectiveness need to be established for PDM BIO-2. Mitigation Measure VEG-1 was designed to supplement this PDM. Details regarding threshold of success are discussed under Mitigation Measure VEG-1.4.

I14-42 The commenter states that the Draft EIS/EIR is vague about who will be responsible for implementing PDMs 3 through 7. All PDMs will be implemented by the Applicant.

I14-43 The commenter states that the Draft EIS/EIR needs to include consequences for not taking the steps outlined in Mitigation Measure WIL-2. As a condition of the BLM geothermal lease, all Mitigation Measures as outlined in the Draft EIS/EIR will be implemented as written.

I14-44 The commenter states that Mitigation Measure WIL-3 does nothing to offset Project impacts to Sierra marten. Marten presence in the area is expected to be infrequent and used primarily while traversing between areas of more suitable habitat. Because the majority of the Project site's Jeffrey pine forest habitat is of marginal quality for Sierra marten due to a lack of snags, downed logs and large trees, this measure was designed to improve the quality of that habitat for Sierra marten in and near the Project site.

I14-45 The commenter states that the Draft EIS/EIR needs to identify an alternative plan to that outlined in Mitigation Measure WIL-4 in the case that deer do not use the new deer crossing. See Response I14-40.

I14-46 The commenter states that Mitigation Measure WIL-5 needs threshold of success, alternative measures, and a performance bond. See Response I14-40.

I14-47 The commenter states that the Draft EIS/EIR needs to be more explicit about what qualifies as a deer crossing or as a movement corridor. Mule deer movement through the Project area is discussed in detail in the Draft EIS/EIR (pages 4.4-14 through 4.4-19), and is discussed in more thorough detail in documents cited in the Draft EIS/EIR (MACTEC, 2011; Paulus, 2011a; Paulus, 2012a; Paulus 2012b). Deer crossings are discussed in detail in Draft EIS/EIR Mitigation Measures WIL-5 and displayed in conceptual form in Figure 4.4-5.

I14-48 The commenter states that both pre- and post-construction surveys are needed for greater sage-grouse, as well as for other special-status species. Pre-construction surveys for greater sage-grouse leks are proposed in Mitigation Measure WIL-7. Other pre-construction surveys are proposed in Mitigation Measure WIL-1 (nesting birds, northern goshawk, migratory birds) and Mitigation Measure WIL-9 (special-status bats; see Response I9-22). No other pre-construction surveys were deemed necessary. The commenter requests post-construction surveys be conducted to detect Project impacts so that additional impact reduction measures can be taken. All Project impacts to special-status species are reduced to a less-than-significant level through Project Design Measures and/or Mitigation Measures. No post-construction surveys are needed.

I14-49 The commenter states that the Draft EIS/EIR proposes no compensatory mitigation of any kind for impacts to wildlife habitat and wildlife movement patterns. Wildlife habitat losses will occur in Jeffrey pine forest and sagebrush scrub habitat types. Both of these habitat types are abundant in the region and the loss of these habitat types due to Project implementation will not alter the existing bioregional trend for Jeffrey pine or sagebrush scrub habitat in the Project area. Compensatory mitigation for losses to these habitat types is not required by any of the regulatory agencies. Impacts to wildlife movement patterns will be reduced to a less-than-significant level through implementation of Mitigation Measure WIL-4 through WIL-6. There is not a need for additional compensatory mitigation.

I14-50 Mitigation measures included in the Draft EIS/EIR will become part of the Project Mitigation and Monitoring and Reporting Plan (MMRP) that are included in permit conditions and enforced by the regulatory agencies. The MMRP will outline each mitigation measure required for the Project, performance standards, and oversight responsibilities of the regulatory agencies that have the regulatory authority to enforce permit conditions. See also Common Response 4, Hydrologic Monitoring, in Section 6.4.3.

I14-51 The commenter states that the reduction in geothermal temperatures in Hot Creek could negatively impact temperature-sensitive species in Hot Creek as well as Owens tui chub. See Response A9-2.

I14-52 The comment is a concluding statement. The commenter is directed to Responses I14-30 through I14-51.

I14-53 The commenter provides a summary of regulatory requirements under CEQA, NEPA, and federal Clean Air Act Sections 176 and 309. This comment is noted.

I14-54 The commenter provides a list summarizing the deficiencies identified in the air resources analysis. The identified deficiencies are addressed in the responses below.

I14-55 See Response I9-6.

I14-56 The commenter identifies significance thresholds recommended by various California air districts, and suggests that it would be prudent for the air resources analysis to use a lower PM10 significance threshold than the one proposed by the proponent. To clarify, the CEQA significance thresholds used in the air resources analysis were not proposed by the CD-IV Project proponent. The air resources significance thresholds were selected by the CEQA lead agency (i.e., GBUAPCD) for the reasons identified on Draft EIS/EIR page 4.2-6. It is worth pointing out that of the nine air districts identified; only two of the air districts currently recommend a lower PM10 construction threshold than used in the Draft EIS/EIR. Note that the BAAQMD has revoked its significance thresholds due to a recent court decision. The fact that two California air district's recommend the use of PM10 significance thresholds that are lower than that used in the Draft EIS/EIR is not a compelling reason for the GBUAPCD to change the PM10 significance threshold. The recommended change has not been incorporated.

I14-57 The commenter provides a summary statement indicating that the air resources analysis failed to adequately characterize construction-related impacts and health risks from operations. The identified deficiencies are addressed in the responses below.

I14-58 The commenter indicates that the air resources analysis does not disclose that the Midwest Research Institute fugitive dust emission factor assumes implementation of control measures such as watering, and therefore the emissions are underestimated. The commenter is referred to the first paragraph on Draft EIS/EIR page 4.2-3, which clearly acknowledges that the subject emission factor includes the effects of typical fugitive dust control measures, such as routine watering that is proposed for the CD-IV Project.

I14-59 It is acknowledged that SCAQMD has used the higher worst-case emissions factor; however, as stated by CARB relative to the worst-case emission factor: "The SCAQMD estimated that 25 percent of their construction projects involve these types of operations, and applied the larger emission factor to the activities. For the remainder of the state, such detailed information is not readily available, so the average emission factor of 0.11 tons PM10 /acre-month was used." (see the third paragraph of the referenced CARB document on page 7.7-2.) There is no evidence to suggest that the higher worst-case fugitive dust emission factor is applicable for the CD-IV Project or for the Mammoth Lakes area. The GBUAPCD agrees with CARB that the emission factor of 0.11 tons PM10/acre-month is appropriate for areas outside of the SCAQMD, such as the Mammoth Lakes area.

The commenter also indicates that the Draft EIS/EIR failed to analyze potential health risks from hazardous pollutants during the operational phase of the Project. However, the closest residential sensitive receptors are located approximately 1.6 miles from the proposed power plant site and the power plant would have negligible toxic air contaminants emissions. For example, DPM emissions in the form of PM2.5 generated during CD-IV Project operations would be approximately 0.2 pounds per day (see Draft EIS/EIR Table 4.2-5). Given that there are no sensitive receptors in the vicinity of the plant site, the health risk from exposure to DPM during CD-IV Project operation and maintenance would be negligible.

Regarding potential health risks to exposure of noncondensable gases such as H_2S during operations, under normal operating conditions, geothermal gases would not be vented to the atmosphere because the geothermal fluid would be contained within a closed-loop heat exchanger system and then reinjected back into the geothermal reservoir. In addition, there is no evidence to support the notion that the CD-IV Project could produce large quantities of ammonia. The health risk from exposure to noncondensable gases and ammonia during CD-IV Project operation and maintenance would be negligible.

I14-60 Odors would not be expected during normal operations because the geothermal fluid would be contained within a closed-loop heat exchanger system and reinjected back into the geothermal reservoir. Regarding odors during construction, the Draft EIS/EIR discloses that during well cleanout and flow testing, geothermal fluids may temporarily release H_2S in concentrations that could produce an objectionable "rotten egg" odor in the immediate vicinity of each well. In addition, Mitigation Measure AQ-4 has been added to the Draft EIS/EIR to ensure that potential releases of H_2S during well testing are adequately controlled. See Response A8-6.

I14-61 The commenter indicates the Draft EIS/EIR should be revised to fully analyze and mitigate the CD-IV Project's n-pentane-related impact. Refer to Responses I9-166 through I9-173.

I14-62 The commenter states that the Project's excess air pollutant emissions would be inconsistent with Mono County General Plan Energy Resources Objective G, and summarizes the purpose of General Plans and General Plan-related law as well as requirements for internal consistency. This comment is incorrect. The vast majority of the CD-IV Project is not subject to the Mono County General Plan. Only a short segment of new pipeline would be located on private land within the jurisdiction of Mono County. Construction of this segment of pipeline would not exceed Mono County General Plan Energy Resources Objective G.This comment is noted.

I14-63 In accordance with NEPA, the BLM has the discretion to specify the underlying purpose and need to which the agency is responding when proposing the alternatives for the proposed action (40 CFR 1502.13). The BLM's NEPA guidance requires the BLM to construct its purpose and need for the action to conform to existing decisions, policies, regulation, or law (BLM NEPA Handbook H-1790-1 page 6.2). The BLM's guidance further explains that for externally generated actions (such as a right-of-way application), the purpose and need must describe *the BLM's* purpose and need, and not that of the

applicant. (Id.) In the case of the Casa Diablo IV Project, the BLM's purpose and need is to respond to the application to construct, operate and decommission the Casa Diablo IV Project including commercial geothermal power generation facilities, wells, pipelines, and associated infrastructure for BLM Geothermal Leases CACA-11667, CACA-14407, CACA-14408 and CACA-11672.

The purpose and need for the proposed action defines the range of alternatives to be considered. The action alternatives are developed to respond to the problem or opportunity that is presented (in this case, the application), and to provide a basis for eventual selection of an alternative in a decision. Tying the purpose and need to the decision to be made aids in establishing the scope of NEPA review, clearly explaining the decision to be made to the public, setting expectations, and focusing the NEPA analysis. While the BLM must analyze a range of reasonable alternatives, it is not required to analyze every possible alternative or variation in detail. According to CEQ regulations for implementing NEPA, an alternative may be eliminated from detailed study if it is determined not to meet the proposed action's purpose and need; it is determined to be unreasonable given the BLM's mandates, policies, and programs; its implementation is speculative or remote; or, it is technically or economically infeasible (BLM NEPA Handbook H- 1790-1 page 6.6.3).

Similarly, CEQA Section 15126.6 (part a) dictates that an EIR describe a range of reasonable alternatives to the project, or to the location of the project that would feasibly attain most of the basic objectives of the project while avoiding or substantially lessening any of the significant effects of the project. CEQA does not require an EIR to consider every conceivable alternative to a project, rather it must consider a reasonable range of potentially feasible alternatives to support informed decision making and public participation. There is no ironclad rule governing the nature or scope of the alternatives to be discussed other than the rule of reason. (*Citizens of Goleta Valley v. Board of Supervisors* (1990) 52 Cal.3d 553 and *Laurel Heights Improvement Association v. Regents of the University of California* (1988) 47 Cal.3d 376).

The Draft EIS/EIR considered a range of reasonable alternatives to the proposed action that were designed to meet the Agency's legal responsibilities and purpose and need for action. Section 2.8, Alternatives Considered but Eliminated from Detailed Analysis, contains a summary of all alternatives considered during the Draft EIS/EIR process but eliminated from detailed analysis. These alternatives include an underground pipeline alternative, reduced power alternative, and an alternate power plant location in Basalt Canyon. Overall, the range of alternatives was extensive and adequate for the purposes of CEQA and NEPA.

The purpose and need for the Proposed Action was in response to the application submitted by ORNI 50, LLC requesting authorization to construct, operate and decommission the Casa Diablo IV Project including commercial geothermal power generation facilities, wells, pipelines, and associated infrastructure for BLM Geothermal Leases CACA-11667, CACA-14407, CACA-14408 and CACA-11672 (Section 1.3.1, *NEPA Purpose and Need*).

An alternative that considered alternative forms of energy such as distributed generation would not meet the stated purpose and need in this case.

I14-64 See Response I14-63.

I14-65 See Response I14-63. The alternatives analyzed in the Draft EIS/EIR propose to use geothermal resources within the Mono-Long KGRA. The proposed CD-IV Project is both physically separated from the other Casa Diablo geothermal complex projects and similarly independent of the other projects, further, each of the neighboring geothermal developments comprising the Casa Diablo geothermal complex (MP-I, MP-II, PLES-I) is a separate project capable of independent operation (i.e., not connected actions).

I14-66 See Response I14-63 and Section 2.8 of the Draft EIS/EIR for a description of the rationale for eliminating this alternative.

I14-67 See Response I14-63 and Section 2.8 of the Draft EIS/EIR for a description of the rationale for eliminating this alternative.

I14-68 The comment correctly describes NEPA and CEQA requirements as well as the Federal Land Policy and Management Act. The comment also correctly points out the stipulations of Geothermal Leases CACA-14407 and CACA-14408 ("Restricted Surface Occupancy Area") and describes the visual effects of the Project on Shady Rest Park and surrounding recreational resources. No additional response is required.

I14-69 The comment notes the Project will result in significant visual effects on recreational uses at Shady Rest Park. The comment notes that Mitigation Measures VIS-1 and VIS-3 do not adequately reduce visual impacts on Shady Rest and other scenic resources and states that the Draft EIS/EIR incorrectly rejected the underground pipeline Project alternative, which would reduce such visual effects. The comment recommends that the mitigation measures in Section 4.18, *Visual Resources*, be revised and that the Project alternatives be expanded to include the underground pipeline alternative to fully address visual effects on Shady Rest and other scenic resources.

Please refer to Responses I8-36 and I8-37 to see proposed revisions to Mitigation Measures VIS-1 and VIS-3. With respect to the comment requesting the evaluation of the underground pipeline alternative, please refer to Draft EIS/EIR Section 2.8, *Alternatives Considered but Eliminated from Detailed Analysis*, page 2-81, under Section 2.8.1, *Underground Pipeline Alternative*. Although this alternative would reduce potentially significant visual impacts associated with the pipelines, this alternative "was eliminated from detailed consideration because it was not technically practical and would cause additional impacts on environmental resources." For example, since the pipelines expand and lengthen as they are heated by geothermal fluid, and contract and shorten when cooled, the pipeline could rupture from such stresses and cannot be buried. In addition, in some locations of the Basalt Canyon area, it is possible that blasting or other hard rock excavation techniques may be required to trench through bedrock. As described in

Section 2.8.1, this technique would result in additional significant environmental impacts related to vegetation clearance, cultural resources, burrowing animals, soil erosion, water quality, noise, and traffic.

I14-70 The commenter provides a conclusion statement summarizing previous comments on the inadequacies of the Draft EIS/EIR. This comment does not provide specific information on the adequacy or accuracy of the Draft EIS/EIR. No response is required.

I14-71 This comment is the same as Comments I14-9 and I14-10. Please refer to the responses to those comments.

I14-72 Refer to Response I14-11.

I14-73 Refer to Response I14-12 through I14-16. See also Common Response 5, Groundwater Resources in Section 6.4.3.

I14-74 Refer to Response I14-18.

I14-75 The commenter states that the Draft EIS/EIR fails to adequately address potential water quality impacts to Mammoth Creek due to construction activities and the installation of new well pads and roads. See Response I14-19.

I14-76 Refer to Response I14-20.

I14-77 Refer to Response I14-22 through I14-24.

I14-78 Refer to Response I14-26.

I14-79 Refer to the Response I14-27.

I14-80 This is a summary comment. Refer to Responses I14-71 through I14-79.

I14-81 The commenter states disagreement with the conclusions of the "potential to occur in the Project Area" (Table 3.4-1) for bald eagle. See Response I14-30.

I14-82 The commenter states disagreement with the conclusions of the "potential to occur in the Project Area" (Table 3.4-1) for golden eagle. See Response I14-30.

I14-83 The commenter states disagreement with the conclusions of the "potential to occur in the Project Area" (Table 3.4-1) for greater sage-grouse, requesting that the potential to occur be categorized as "High". See Response I14-31.

I14-84 The commenter states disagreement with the conclusions of the "potential to occur in the Project Area" (Table 3.4-1) for prairie falcon, requesting that the potential to occur be categorized as "Moderate" or "High". See Response I14-32.

I14-85 The commenter states disagreement with the conclusions of the "potential to occur in the Project Area" (Table 3.4-1) for five species of bat: silver-haired bat, western red bat, long-eared myotis, long-legged myotis, and Yuma myotis. See Response I14-33.

I14-86 The commenter states disagreement with the conclusions of the "potential to occur in the Project Area" (Table 3.4-1) for Sierra Nevada red fox. See Response I14-34.

I14-87 The commenter states that the Draft EIS/EIR does not include an analysis of American badger (*Taxidea taxus*) or mountain lion (*Puma concolor*). See Response I14-35.

I14-88 The comment is a concluding statement. The commenter is directed to Responses I14-81 through I14-87.

I14-89 The commenter states that the Draft EIS/EIR does not discuss the Project's contribution to habitat fragmentation and movement corridors. See Response I14-37.

I14-90 The commenter states that the Draft EIS/EIR fails to adequately evaluate cumulative impacts of the Project on special-status species, and states that the Draft EIS/EIR should have included a number of maps showing existing and conceivable future development. See Response I14-38.

I14-91 The commenter states that PDM BIO-1 does not provide sufficient details regarding determining impedance of wildlife movement caused by the pipelines. It also requests additional monitoring details. See Response I14-40.

I14-92 The commenter states that thresholds of success as well as measures of effectiveness need to be established for PDM BIO-2. See Response I14-41.

I14-93 The commenter states that the Draft EIS/EIR is vague about who will be responsible for implementing PDMs 3 through 7. See Response I14-42.

I14-94 The commenter states that the Draft EIS/EIR needs to include consequences for not taking the steps outlined in Mitigation Measure WIL-2. See Response I14-43.

I14-95 The commenter states that Mitigation Measure WIL-3 does nothing to offset Project impacts to Sierra marten. See Response I14-44.

I14-96 The commenter states that the Draft EIS/EIR needs to identify an alternative plan to that outlined in Mitigation Measure WIL-4 in the case that deer do not use the new deer crossing. See Response I14-40.

I14-97 The commenter states that Mitigation Measure WIL-5 needs threshold of success, alternative measures, and a performance bond. See Response I14-40.

I14-98 The commenter states that the Draft EIS/EIR needs to be more explicit about what qualifies as a deer crossing or as a movement corridor. See Response I14-47.

I14-99 The commenter states that both pre- and post-construction surveys are needed for greater sage-grouse, as well as for other special-status species. See Response I14-48.

I14-100 The commenter states that the Draft EIS/EIR proposes no compensatory mitigation of any kind for impacts to wildlife habitat and wildlife movement patterns. See Response I14-49.

I14-101 See Common Response 4, Hydrologic Monitoring, in Section 6.4.3.

I14-102 The commenter provides a summary statement that the Draft EIS/EIR contains flaws in analysis. The commenter's specific comments are addressed below in responses to Comments I14-103 through I14-111.

I14-103 See Response I9-6.

I14-104 The commenter questions the Draft EIS/EIR's use of thresholds adopted by the ICAPCD. See Response I14-56, above.

I14-105 See Response I14-57.

I14-106 See Response I14-58.

I14-107 See Response I14-59.

I14-108 See Response I14-59.

I14-109 See Response I14-61.

I14-110 See Response I14-60.

I14-111 The commenter provides a conclusion statement summarizing comments responded to in Responses I14-53 through I14-110 above.

Letter I15 – Responses to Comments from Laborers International Union of North America (LIUNA) Bishop Residents

I15-1 The commenter states that Bishop residents will be directly affected by the Project's impacts on sensitive and special-status species identified in the Draft EIS/EIR. Impacts to special-status species are fully disclosed, discussed, analyzed, and mitigated for in the Draft EIS/EIR (see Sections 4.3 and 4.4).

I15-2 See Response I14-63 and Common Response 2, Recirculation in Section 6.4.3.

Letter I16 – Responses to Comments from Liz O'Sullivan

I16-1 The commenter expresses support for the CD-IV Project. This comment is noted.

I16-2 The commenter indicates that Shady Rest Park will not be unduly harmed by the Proposed Action; however, recreation access should not be obstructed. As discussed on Draft EIS/EIR page 4.14-10, operational vehicles could be increased along the Shady Rest Park entrance road to Shady Rest Park and could result in delays in access to Shady Rest Park. The addition of vehicular traffic associated with Project maintenance activities in the vicinity of the OSV staging area could result in safety hazards near the staging area. Therefore, **Mitigation Measure REC-3** requires ORNI 50, LLC to coordinate with the Town of Mammoth and the USFS to ensure that the OSV staging area, and road access to the staging area, is plowed during winter. As discussed in Section 4.11, Noise, noise levels from the well pump at Well Site 38-25 would likely be audible at Shady Rest Park. However, the noise would not be expected to be disruptive, considering the typically noisy nature of activities conducted at the park. Finally, the pipelines in areas of higher visual quality value and all wells, including those located near Shady Rest Park, will be of textures and color/colors that blend in with the environment (PDM VIS-3 and VIS-4). Therefore, recreation access and use of Shady Rest Park would not be obstructed.

I16-3 The commenter expresses approval of the proposed technology and urges the BLM to fully approve the CD-IV Project. This comment is noted.

Letter I17 – Responses to Comments from Dan McConnell

I17-1 The commenter requests that Ormat studies the creation of a geothermal heating district in an effort to share the geothermal resource with the USFS and Town of Mammoth Lakes. This comment is beyond the scope of this Project and does not address the adequacy or accuracy of specific Draft EIS/EIR components. This comment is noted.

Comment O1 – Responses to Comments from John Walter

O1-1 The commenter states that his concerns are regarding recreation. This comment is noted. The commenter is referred to Section 3.14 and 4.14 for a complete discussion of CD-IV impacts on recreation and Responses A4-7, A4-8, all responses to letter I10, and I2-6.

O1-2 The commenter questions the smell from the existing wells and if the associated emissions were analyzed by the EIS/EIR. The commenter is referred to Section 4.2, *Air Quality*, for a discussion of odor and risk from H_2S emissions. Page 4.2-13 states "Odors would not be expected during normal operations because the geothermal fluid would be contained within a closed-loop heat exchanger system and reinjected back into the geothermal reservoir". Also see Responses A8-6, I9-162, I9-163, and I11-24. It is possible some of the sulfur smells may be related to natural fumaroles known to be in the area. One fumarole is located approximately 750 feet northwest of proposed well 55-31. There's also a thermally altered area about 1,200 feet north of existing well 57-25.

O1-3 The commenter raises the issue of operational noise resulting from the wells in the vicinity of recreation. The commenter is referred to Section 4.11.1.2 for a discussion on long term

operation and noise impacts. Section 4.14.4.1, *Proposed Action*, addresses conflicts with recreation and noise generated from operation of the CD-IV Project. The commenter is also referred to Responses A4-18 through A4-21.

O1-4 The commenter identifies difficulties associated with cross country skiing off the designated trails with respects to pipeline and road crossings. This concern was shared by other commenters and Mitigation Measure REC-3 was revised to address this issue. The commenter is referred to Response I10-24.

O1-5 The commenter is referred to Response I10-24

O1-6 This comment is noted.

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ATTACHMENT 1
CV for Jim Paulus

Dr. Jim Paulus, Biologist

Jim Paulus received his doctorate of science degree in the field of biology from the University of California, Santa Cruz. He was trained in botany by the classical phylogenist Dr. Patrick Elvander and completed studies of California's natural communities and ecology in the Cooper tradition under Dr. Jean Langenheim. Dr. Paulus' research in natural plant communities has been applied in the design of sustainable agricultural systems, and his work has received recognition at the national level by the Pew Charitable Trust and American Association for the Advancement of Science. Most recently, his research on the uses and cultivation of native vegetation has been successfully applied to solving dust pollution at Owens Lake in Inyo County, California.

For the last 16 years, Dr. Paulus has developed expertise in identifying and managing the often sensitive biological resources of the Eastern Sierra Nevada. He has provided environmental consultant services for governmental agencies including the County of Mono Community Development Department, and also has assisted land owners and managers working in all the major habitat types present within Mono and Inyo Counties. Highlights of this work include multi-species management in the Owens Valley, where he worked for 10 years with a local agency to formulate and oversee avoidance and mitigation within 100 square miles of project area. During the last twelve years, Jim has been responsible for negotiating and conducting forest remediation in conjunction with geothermal resource development within the Inyo National Forest near Mammoth Lakes. Dr. Paulus has performed formal wetland delineations in the Eastern Sierra since 1993, ranging from spring-fed wetlands at the edges of the desert in Inyo County to alpine riparian corridors in northern Mono County. Jim has repeatedly dealt with local issues and has established a history of assessing the presence or absence of the rare species that may potentially occur in Mono County. His knowledge of the local biota and relevant environmental issues has been captured in many successful project EIR's through his technical reports and his ability to write authoritative botanical and wetland resource overviews. To date, he has authored over 200 biological survey technical reports, sections in EA, IS, BE, and EIR documents to meet CEQA or NEPA reporting requirements, and wetland delineations for Clean Water Act permitting.

The following is a representative selection of the most recent reports that Dr. Paulus has prepared for projects in the Mono County:

Paulus, J, 2002. Assessment of Botanical Resources for the Rhyolite Plateau and Upper Basalt Canyon Geothermal Exploration Areas, Mono County, California (12,000 acres). Report dated August 1, 2002, prepared for Environmental Management Associates, Brea.

Paulus, J, 2004. Botanical report for the proposed White Mountains Estates housing site. Report dated July 30, 2004, prepared for the Mono County Community Development Dept., Mammoth Lakes, California.

Paulus, J, 2004. Botanical Survey Report for the Proposed Paradise Subdivision. Report dated August 29, 2008, prepared for Bauer Planning and Environmental Services, Irvine.

Paulus, J, 2005. Botanical report for the Tom's Place USFS Land Exchange site. Report dated November 17, 2005, prepared for the Mono County Community Development Dept., Mammoth Lakes, California.

Paulus, J, 2006. Delineation of Waters of the State of California and Wetlands within the Adobe Ponds Project Area, Adobe Ranch, Mono County, California. Report dated July 10, 2006, prepared for Greenbridges LLC, Bakersfield.

Paulus, J, 2008. Botanical survey for the Rock Creek Canyon Project. Report dated August 29, 2008, prepared for Bauer Planning and Environmental Services, Irvine.

Paulus, J, 2008. Assessment of Biological Resources for the Airport Utility Underground Project at Mammoth Yosemite Airport. Report dated October 30, 2008, prepared for Public Works Department, Town of Mammoth Lakes, California.

Paulus, J, 2009. Revegetation plan for the Casa Diablo Trenches Project: Workplan dated April 28, 2009, prepared for Ormat Co., Carson City, and U.S. Forest Service, Bishop Office.

Paulus, J, 2010. Botanical survey report for the Mammoth-Yosemite Airport Access Road. Report dated July 25, 2010, prepared for the Town of Mammoth Lakes, California.

Paulus, J, 2011. Natural Environment Study (NESMI): Sierra Park and Sierra Nevada Sidewalks Project #SRTSL-5439(022). Report and Permit Application dated April 22, 2011, prepared for Caltrans, District 9 Bishop and Town of Mammoth Lakes, California.

Paulus, J, 2011. Assessment of Biological Resources: Vista Towers Wireless Telecommunications Facility at Crowley Lake, Mono County, California. Report dated September 6, 2011, prepared for County of Mono Community Development Department, Mammoth Lakes, California.

Paulus, J, 2011. Assessment of Biological Resources: M-1 Replacement Power Plant at Casa Diablo, Mono County. Report dated December 20, 2011, prepared for Environmental Management Associates, Brea, California.

Personal references are available for the above projects, and for work completed in the Eastern Sierra Nevada ranging back into the early 1990's. For additional past project details, and for personal references, Jim can be reached at j_paulus@msn.com. General references:

Ted Schade Great Basin Unified Air Pollution Control District, Bishop (760) 872-8211
Mr. Schade, Director, supervised Dr. Paulus' work in the Owens Valley for 13 years.

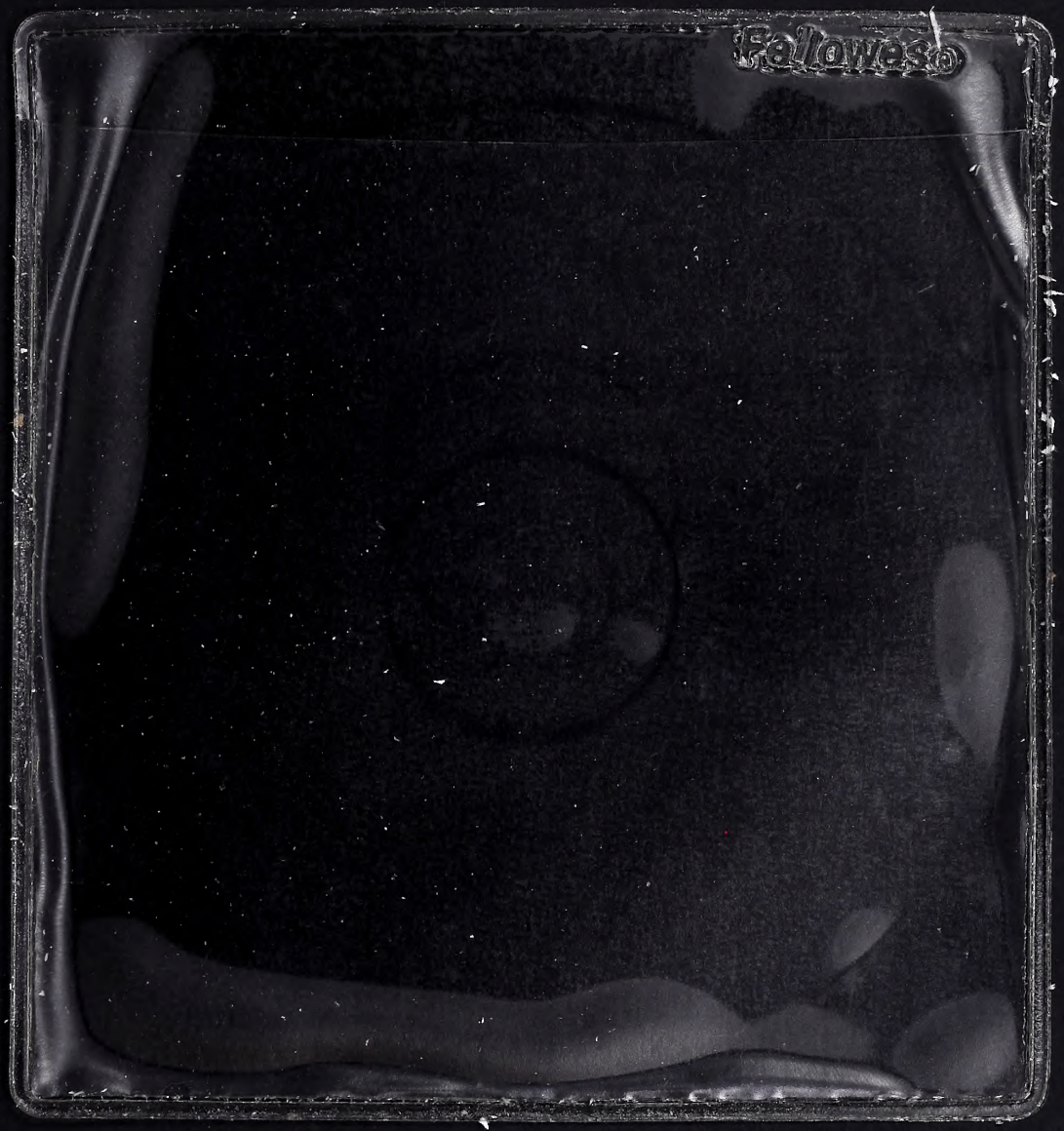
Scott Burns Mono County Planning Dept. (760) 924-1800
Mr. Burns, Planner, directs an agency that has used Dr. Paulus' services since 1996

Larry Nickerson Mammoth-Pacific Geothermal Energy (760) 924-4774
Mr. Nickerson, Plant Supervisor, has used Dr. Paulus' environmental services since 2000

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